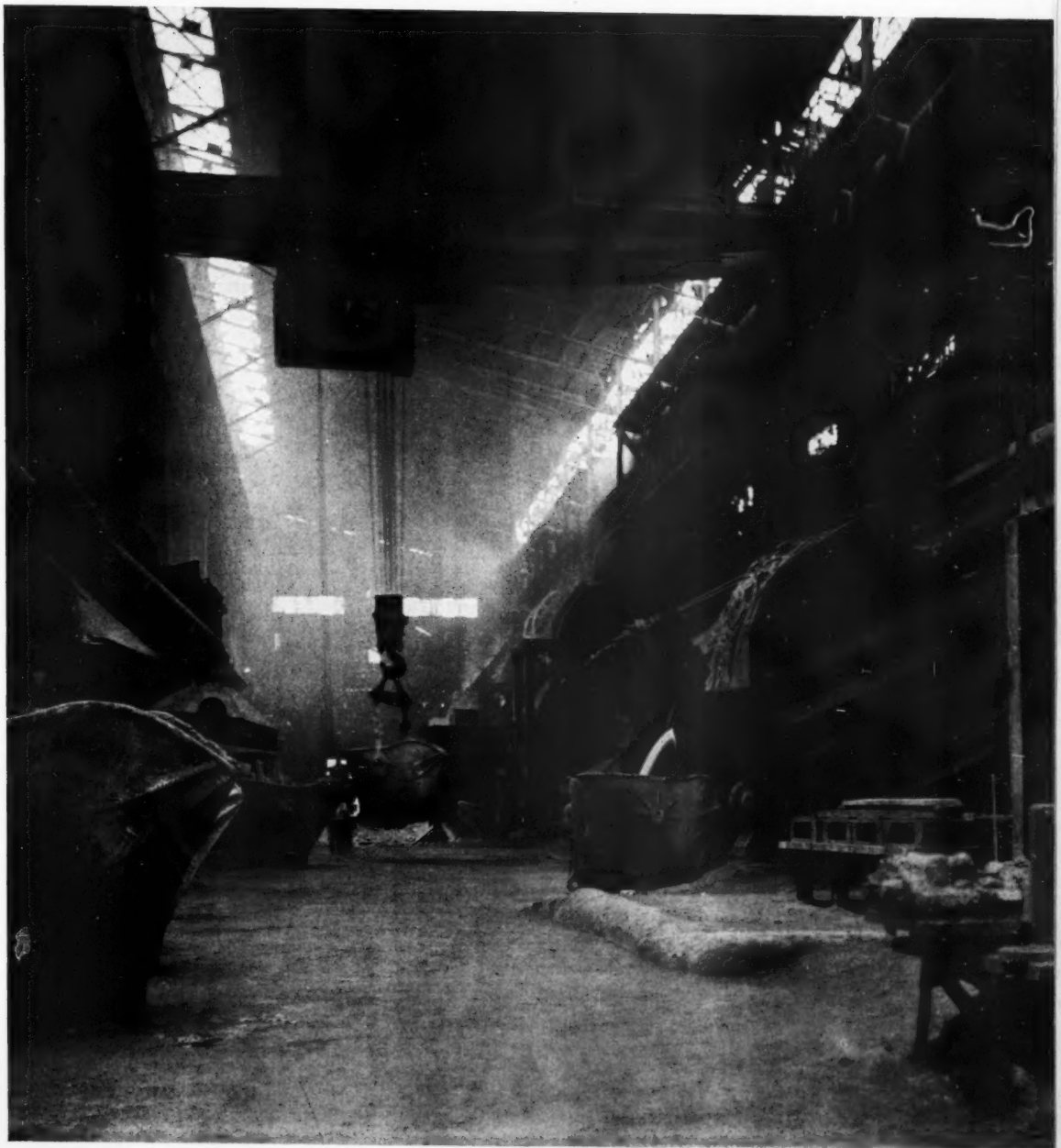
MINING CONGRESS JOURNAL

MAY
1942



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MINING CONGRESS JOURNAL

Vol. 28 MAY, 1942 No. 5

Declaring coal production and railroad transportation are activities vital to the success of the Nation's war effort and listing "critical occupations" within these industries, Major Gen. Lewis B. Hershey, Director of Selective Service, on May 6, advised State Directors that persons engaged in the listed occupations may be considered for deferment from military service as "necessary men."

The "critical occupations" in the coal industry were certified to the Selective Service System by the United States Bureau of Mines, General Hershey's memorandum states. Sixty-two occupations are listed, ranging in alphabetical order from "blaster" to "welder."

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Opinions expressed by authors within these pages are their own, and do not necessarily represent those of the American Mining Congress

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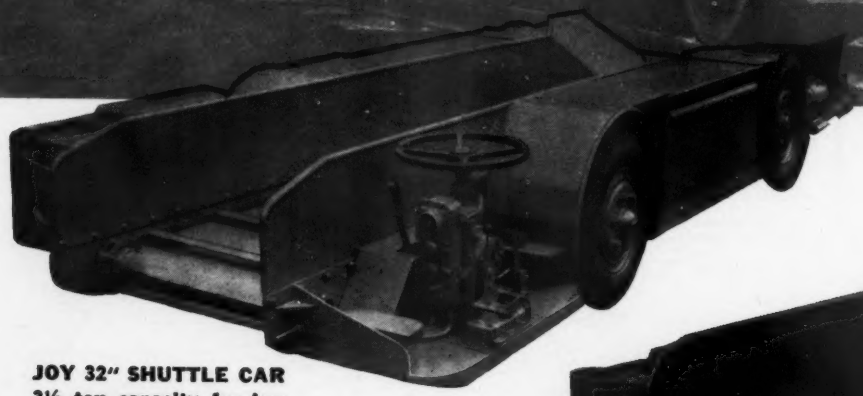

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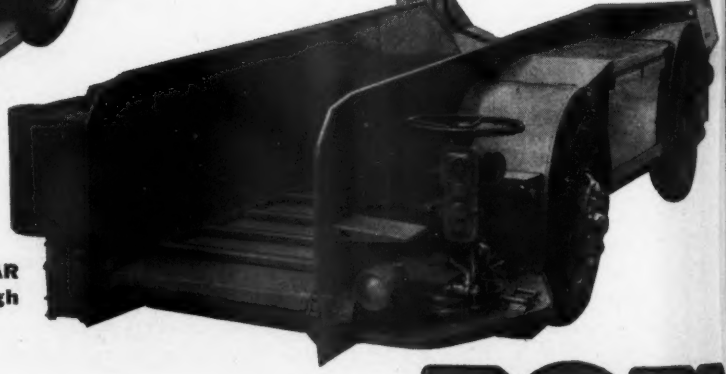

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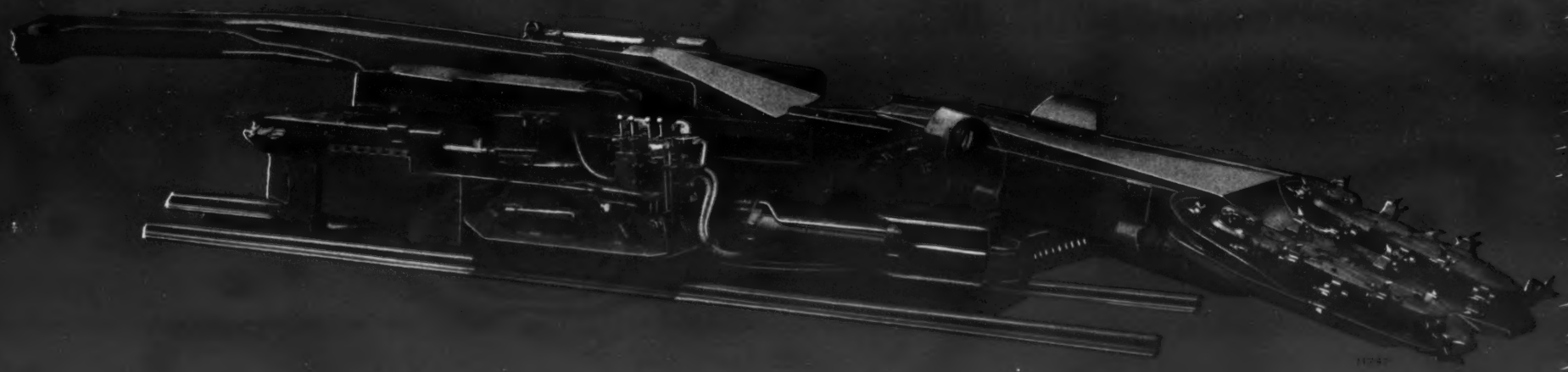

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A JOURNAL FOR THE ENTIRE MINING INDUSTRY—PUBLISHED BY THE AMERICAN MINING CONGRESS

MINING CONGRESS JOURNAL

HARRY C. CHELLSON
Editor

Vol. 28 MAY, 1942 No. 5

THE "FORTY-NINER" OFFERS A LESSON

DETERMINATION and intestinal fortitude to mine gold through hard work and the conservation of crude tools won the California "forty-niner" a respect that has characterized the hard rock miner down through the years. Today, there are hundreds of gold mines in California and elsewhere which must call increasingly on their own resources because the WPB evidently considers their product less essential to the winning of the war. Operators, miners and their families in 20 of California's major gold producing counties are affected by this order, not to mention many other gold mining camps in Colorado, Nevada, Montana, Idaho, New Mexico and other Western States.

Obviously, problems in gold mining today are radically different than they were in 1849. Many mines are deep and, if forced to shut down, would become flooded and caved and perhaps never be reopened. Such unfortunate results are not desired by any government official, much less by the operators, miners, and the communities they support. But when a war of survival faces our Nation every American takes orders. Within a democracy, however, he keeps fighting for the survival of his community or industry, but in a spirit of cooperation with his government. Meanwhile his determination and ingenuity to keep working (in spite of priorities) demonstrates his conviction it is for the interest of the national welfare.

This spirit was exemplified in a recent resolution of approximately 200 gold mine operators in California, to conserve their materials and mining equipment to the fullest extent. They have formed community units, pooling supplies of salvaged materials, and are repairing every possible item of equipment. They are cooperating in the use of machines and endeavoring in every way to work with the local representatives of WPB's Mining Branch. Other important gold mining districts have tightened their belts in similar fashion.

As the spirit of courage and determination rewarded the "forty-niner" in his period of adversity, it is reasonable to believe our government will not completely ignore the small essential requirements of the gold mining industry, affecting several hundred thousand citizens, who also wish to buy war bonds and stamps and offer their sons to fight for their country.

SAFETY FIRST ON THE HOME FRONT

ALL coal and metal mine operators, superintendents and foremen today have the capacity for carrying more worries, headaches and responsibilities they little dreamed of a year ago. The horsepower, materials and supplies, and manpower that produced the daily tonnage of ore or coal then are today influenced by events in a war, operators have little time to analyze. They say "We are at war, and we must win no matter the cost."

On the battlefield, experienced and trained soldiers know there is much risk, and in a split second life and limb are no more. On the home front, in the mines, green and inexperienced men work to produce the minerals so vital to win the war. Their willingness to learn to cooperate and to take training is admirable. They feel closer perhaps to the front line because they knowingly venture into work that has its own elements of risk. Every member of a mining staff and every miner has respect for a man anxious to work underground and is willing to help him. But in spite of this, and all the State and Federal rules set forth for protection in mines, a newcomer should be encouraged to ask questions if he is in doubt about *anything*.

Not only staff safety engineers, superintendents, foremen and bosses, but the miners themselves, should be self-appointed safety engineers to every new man. All share the responsibility to impress the doctrine of Safety First even if it does take a minute or two. Sometimes a split second may save a life underground where it won't be on the battlefield. The fact that it takes 17 men on the home front today to keep a soldier on the battlefront underscores the importance of keeping that 17-man team working with a minimum of lost hours and worry for everybody.

Some Comparisons of TRACK WELDING Methods

At the mines of Koppers Coal Division of Eastern Gas & Fuel Associates, thermit and electric welding have contributed to lower maintenance costs for rail bonds, rolling stock, track and improved conductivity of return d-c circuits for electric haulage.

THE electric welding of joints in main line track has been performed in Powellton mines of The Koppers Coal Division since 1932. Approximately one and one-half miles of 50-lb. steel rails were welded in place at Powellton No. 2 Mine in 1932 after the track had been laid for two or three years with standard connections.

At this time, the method used provided for the ends of the angle bars to be welded to the base and sides of the rail and the tops of the angle bars to the ball of the rail. (See Fig. 1.)

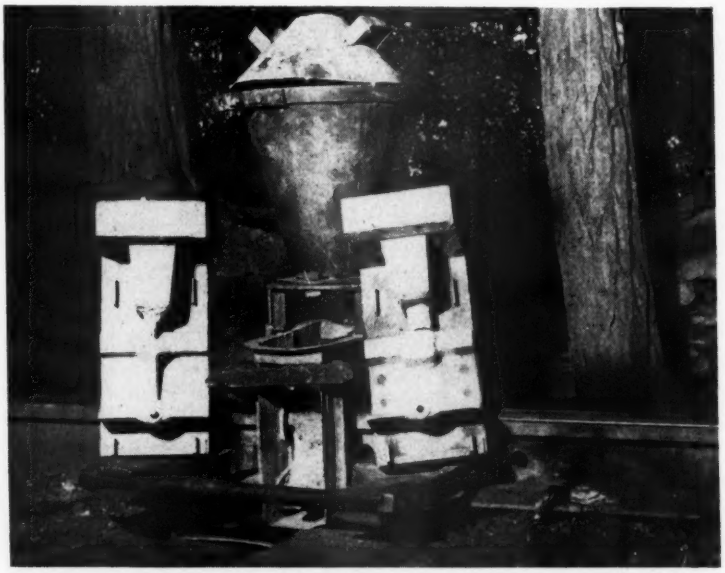
Small wedges were used behind spaces left by any curvatures in angle bars, and welded in place. The work was done with a track resistance welder using Lincoln stable arc welding rods. This track was moved during 1939 and 1940 and the welded joints found to be in good condition.

The primary purpose in welding the joints in this mine was to lower the resistance of the return d.c. circuit. However, it also served to keep the joints solid, with a smooth running surface.

During 1932 at Powellton No. 4 Mine the joints in approximately one mile of main line track laid with 85-lb. steel rails were welded in the same manner as at Powellton No. 2 Mine; that is, the ends of the angle bars were welded to the base and sides of the rails, and the tops of the angle bars, to the ball of the rails. In addition, the ends of the rails were "V'd" off on the ball of the rails with an acetylene torch, and the ends of the rails also welded together by filling in the space thus made. (See Fig. 2.)

The welding was done with a standard resistance arc welder bonding machine using Lincoln stable arc welding rods. The resistance of the joints was found to be as low as the solid rail. A part of this track was laid on wet road bed. The locomotives and mine cars were heavy and several of these joints broke at the weld and were re-welded. However, the track is still in service and most of the joints are in good condition. This steel being larger than at Powellton No. 2 Mine and with the extra expense for "V'ing" and welding the ends of the rails the cost increased.

In thermit track welding, an insert of rail analysis steel is first placed between the rail faces at the top or ball of the rails and held in place by track clamps



Two specially designed aluminum patterns attached to wooden backboards, for the inside and outside of the rail are used to hold the molding material in place

During 1933 and 1934 the joints on 3,000 ft. of track laid with 60-lb. relay steel were welded at Midvale Mine in the same manner as at Powellton No. 2 Mine. (That is, the ends of the angle bars were welded to the base and sides of the rail and the top of the angle bars to the ball of the rail. No welding was done at the ends of the rail.) A standard arc weld bonding resistor and Airco 87 coated arc welding rods were used.

During 1937 at Powellton No. 5 Mine approximately three miles of main line track laid with 60-lb. relay steel were welded at the joints. This work was anticipated before the track was laid and preparations were made for it. A low voltage rotating Lincoln welding machine and stable arc welding rods were used. Two methods were employed as follows:

1. Twenty-four inch angle bars were used. Before bolting to the rail, 16 in. of the middle portion of the bottom leg was trimmed with an acteylene torch, leaving 4 in. of the full angle bar at each end. The angle bars were then welded to the rails, along this 16-in. cut. (See Fig. 3.)

This method did not prove entirely satisfactory. Cutting away a portion of the angle bar weakened it to such an extent that kinks or slight angles developed at the joints and smooth curves could not be maintained. This method was discontinued.

2. Instead of cutting out 16 in. from the middle of the bottom leg of the angle bar as was done by the previous method, 8 in. was trimmed from both ends of the bottom leg, leaving 8 in. of the complete angle bar in the middle. The angle bars were then welded to the rails along these two 8-in. cuts. (See Fig. 4.) This stiffened the joint sufficiently to make a satisfactory job. Tests show that the electrical resistance of the bolted joint plus a single 4/0 bond is as follows:

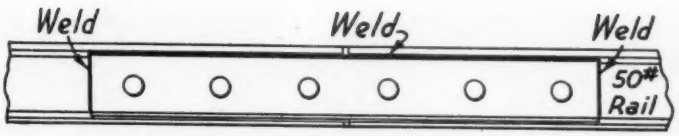


Fig. 1. At the Powellton No. 2 Mine in 1932, the ends of the angle bars were welded to the base and sides of the rail, and the tops of the angle bars to the ball of the 50-lb. rail

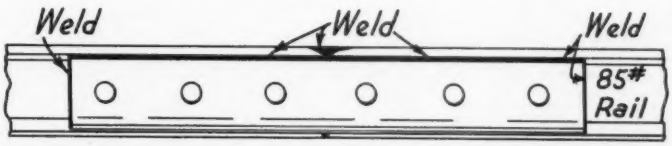


Fig. 2. At Powellton No. 4, the time and method was the same as in Figure 1, except in the 85-lb rail the ends were cut V-shaped, and then welded together, filling the V

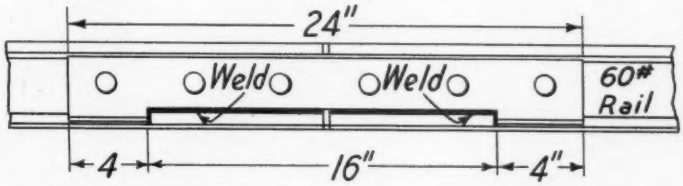


Fig. 3. During 1933 and 1934 the joints on 3,000 ft. of 60-lb. rails were welded at the Midvale Mine, similar as at Powellton No. 2, except no welding was done at the end of the rails. This method was discontinued

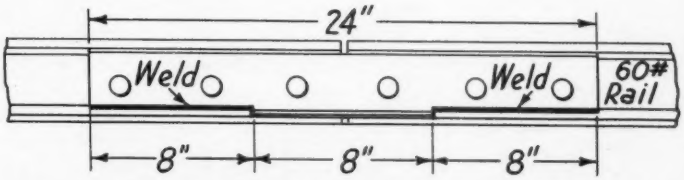
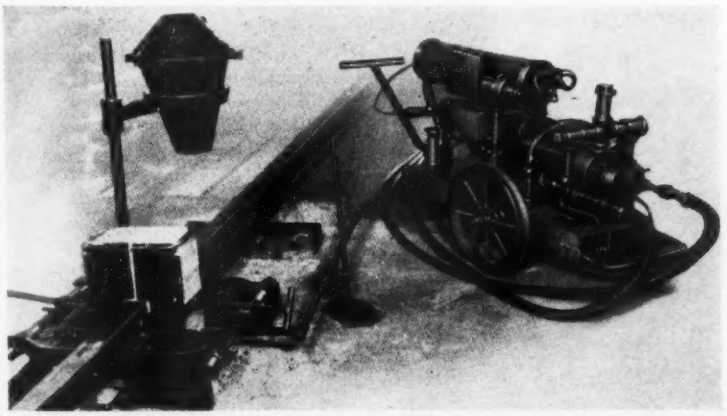


Fig. 4. In this method the angle bars were welded to the rails along two 8-inch cuts. This proved satisfactory

Rail	Welded Joints	Bolted and Bonded Joints 1-32"—4/0 Bond
50-lb.	Equal to solid rail	7 to 25 ft. of rail average 16 ft.
60-lb.	Equal to solid rail	8 to 20 ft. of rail average 14 ft.
85-lb.	Equal to solid rail	8 to 16 ft. of rail average 11 ft.

The costs of the two types of joints are as follows:

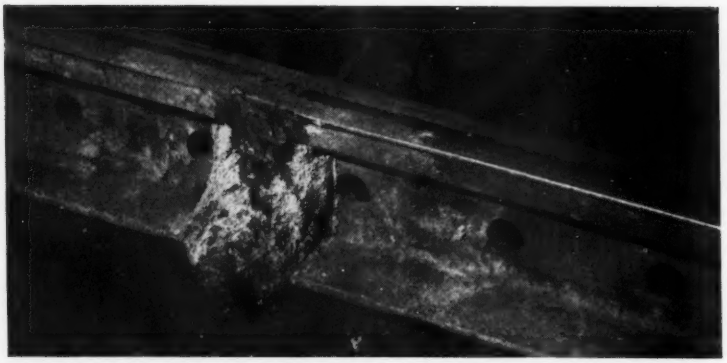
Rail	Welded Joint	Bolted and Bonded Joint
50-lb.	$3.15	$3.23
60-lb.	3.50	3.48
85-lb.	4.10	4.44



The complete mold is securely clamped around the joint to be welded, and is now ready for pre-heating. The molding material is a mixture of sand, fireclay, and a little water

The pre-heating unit is portable. It forces ignited vaporized kerosene into the mold through a hole at the bottom. About 30 minutes are required to raise the temperature of the 85-lb. rail to 1750 deg. F.

The proper Thermit mixture for the 85-lb. rail is poured in a conicle-shaped crucible, where it is ignited and heated to a molten mass and tapped into the mold around the rail



After the mold is removed, the weld is rough dressed with a hot cutter and sledge hammer while at red heat

In November, 1939, the first Thermit rail welds were installed in the Kopperston mine. To date approximately 1,600 have been put in. This type of rail welding is now used entirely on main haulage roads, which will have a long life, in both mines at Kopperston.

When the Thermit rail welding was first started the practice was to weld the rails in 90-ft. lengths outside the drift mouth and haul these sections into place in the mine, and bolt them together with plates. On week-ends or slack periods, the plates were removed and the joints welded. Now that the main entries have been driven a considerable distance, the track is usually laid up with the standard bolted connections and practically to final grade. After the joints are welded, the track is given its final grade and surface.

The first step in welding is to bring the faces of the rail joints in alignment. Then a steel insert (for an 85-lb. rail is ½ in. thick, ⅞ in. deep and 2¼ in. long) is placed between the rail faces at the top or ball of the rails. This insert is so placed that it projects slightly above the top of the rails and slightly beyond the inside or gauge side of the rails. The insert serves two purposes; first—as a spacer during the welding process, and second—as a wearing surface at the joint when the weld is completed. The insert is made of rail analysis steel. Before the insert is placed, the bolted connections have been removed and track clamps, such as shown in Fig. No. 1, put in place. These track clamps do a twofold job; namely, they hold the insert in place and keep the rail ends in alignment. After the rails have been properly aligned and spaced, they are ready for the mold.

The molding material is a mixture of sand, fire clay and a little water. The mold itself is made by ramming the molding material into sheet iron mold boxes which have been placed over specially designed aluminum patterns attached to wooden backboards. (See Fig. 2.) The molds are made in two halves, one for the inside and one for the outside half of the rail. The two halves of the mold are then clamped to the rail, forming a complete mold as shown in Fig. 3.

The rails are now ready to be preheated. This is accomplished with the preheater shown in Figure No. 4, which forces ignited vaporized kerosene into the mold through a hole provided near the bottom. It requires about 25 to 30 minutes to raise the

(*Continued on page* 48)

Operating a Two-Loading Point Regenerative Incline

The system described in this article is controlled by a regenerative type monitor retarding machine, which handles the mine run tonnage from the Block group of coal mines operated by the Block Coal & Coke Company, Block, Tennessee.

By M. M. HALEY
Chief Engineer
Block Coal & Coke Co., Inc.

THIS incline is on the east slope of the Cross Mountain Range where numerous coal seams were originally located. The ruggedness of the mountain side, and the "benches" that follow certain outcrop horizons, made the selection of a desirable location for gravity plane haulage a complex problem, especially when the length of the project was considered. The coal seams worked in most of the collieries in this district are high up in the mountains well above the railroad and tipple level in the valley.

The common type friction drums are employed to control the speed of the haulage rope which is attached to the descending loaded monitor, and the ascending empty monitor. This general assembly utilizes the long tried and proved gravity haulage system.

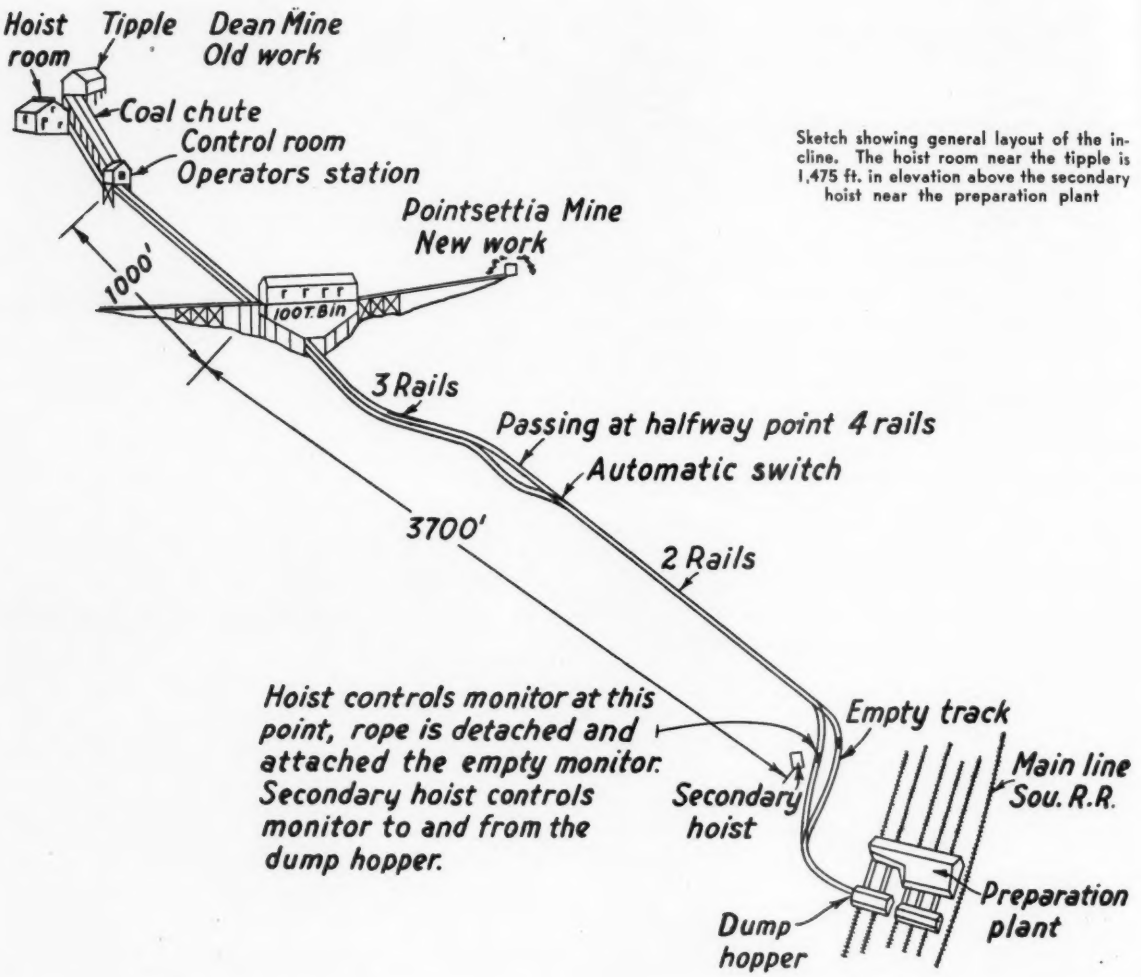
Up until about three years ago, this company used the gravity system to control old type monitors carrying about eight tons each of mine run coal, which worked rather satisfactorily at times from one loading point. When it became necessary to have the second loading point down the plane at a lower elevation for a new mine, it was realized that direct mechanical-electrical control of the monitors was necessary to satisfactorily handle a sizable tonnage with safety.

The engineering staff of Stuart-James & Cooke, 17 Battery Place, New York City, were consulted and an exhaustive study of the problem was made and the proper type of control was decided upon. The Link-Belt Company was awarded the contract to install the complete mechanical-electrical hoist assembly which is designed to handle, on a 4,700-ft. plane having an average pitch of 20 deg., one loaded descending monitor having a gross weight of 20 tons and the ascending monitor a net weight of eight tons at a constant speed of 1,350 ft. per min.

The operator in the control room has this view of the incline. Directly ahead is the loading station for the new Poinsetta mine. In the bottom of the valley can be seen the faint outline of the preparation plant

This monitor is a four door drop bottom type with a capacity of ten tons. It is at rest near the switching point

At the top of the incline, the operator carefully guides the movements of the monitors from the control room

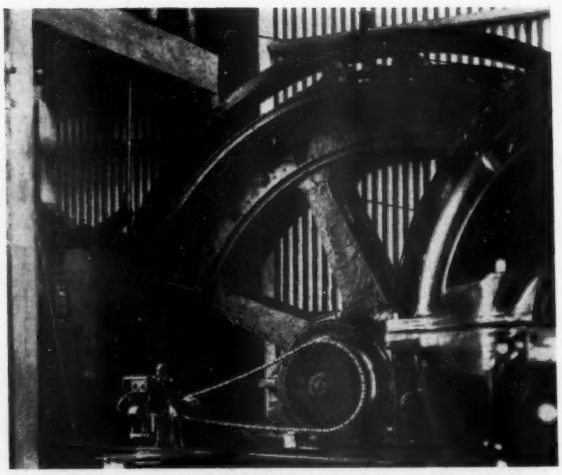


Sketch showing general layout of the incline. The hoist room near the tipple is 1,475 ft. in elevation above the secondary hoist near the preparation plant

on a standard gauge track laid with 65-lb. rails. The haulage cable is 1¼ in. in diameter and 4,900 ft. long. The usual troubles are encountered trying to prevent undue wear on the rope.

Many modern ball-bearing rollers are used but some rather old-time wood rollers are found quite desirable in "flat" places. Planking and rub blocks are also much in evidence to help fight friction. The monitors are of the four-door drop-bottom type. The trucks are solid wheels 30 in. in diameter with ball-bearing rollers.

The retarding machine at the top of the plane is 1,475 ft. above the lower end of the plane or "bottom." The general assembly of the lowering machine consists of a structural steel welded frame or base. This base supports the two grooved drums, mounted vertically for winding the 1¼-in. haulage cable that has 180 deg. contact on each drum. Each drum spider is turned to a diameter of 8 ft. and 1 in. and 2½ in. wide, respectively.



Part of the General Electric thruster is seen to the left of the drum assembly. Above is the hand brake connection. The speed control governor in the foreground is connected by a chain driven from the hub of the drum

On the rear or driving drum the rings are attached rigid to the spider while on the front of the idler drum the rings are loose and lubricated by alemite connections passing through the spider to the contact surfaces inside. This arrangement equalizes the stress in the rope and prevents the drum shaft from being broken as was the common experience with the old style gravity drums.

There is also a brake drum attached which is 8 ft. and 4 in. in diameter with a face of 8½ in. The brake band is lined with "Thermoid" friction lining 8 in. wide and ⅜ in. thick, 23 ft. 9 in. long. The weight of the brake band assembly is supported by coil springs attached to a structural steel supporting ring.

Braking is applied either by manual or automatic control. While handling men and materials car or spotting the empty monitor under the loading chute, the hand brake system is used. When the machine is lowering coal the controller is wide open and the braking is automatically operated by a 600-lb Thruster made by the General Electric Co.

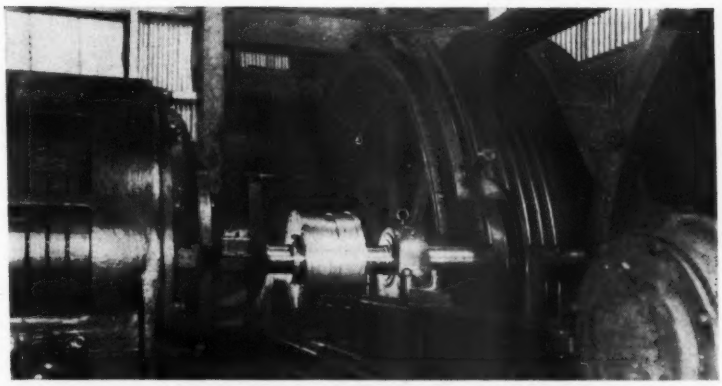
On the side opposite of the brake, is mounted the cast steel gear ring 108 in. P. D. with a 7½-in. face, which is driven by a 9-in. P. D. forged steel pinion mounted on a counter-shaft 5 7/16 in. in diameter by 76½ in. long that is supported by two roller bearing pillow blocks. Each drum is cast steel, the hub is 28 in. long and fitted with an 11-in. shaft which is supported by two 9-in. diameter Shafer radial thrust roller bearings.

The electrical equipment consists of one a.c. motor—300 hp., 600 r.p.m., 2,200 volts, 3-phase, 60 cycles—for mine hoisting service operating neatly at exact synchronism. On the shaft opposite the coupling is mounted a tachometer generating device that indicates through a graduated dial on the operator's board the speed of the monitor while handling coal. The motor shaft is connected to the counter-shaft through a Waldron No. 5 torque ring flexible coupling.

In the event something goes wrong and permits the maximum speed to build up, there is a control governor operated by a roller chain from the counter shaft which is adjusted to break contact at 15 percent overspeed and stop the machine from any operation until adjustments are manually made.

The operator's station is approximately 125 ft. from the building in which the machinery is housed and is located directly over the plane. Clear vision over the entire line is provided most of the time except when fog or clouds prevail. To assist the operator to locate the monitors during the night, white prismatic reflectors are mounted on the front end of the monitors. The switch board system controlling the action of the driving motor is fully automatic and is provided with almost every convenience and accessory necessary.

The main office of this company is in Knoxville, Tenn., 402 Empire Building, and the engineering office is at Block, Tenn. W. G. Polk is president; W. G. Polk, Jr., is production manager; J. W. Howe, general superintendent; W. G. Howe, assistant general superintendent, and M. M.-Haley, chief engineer.



General view of the hoist with the band brake on the left side and spur gear on the right of the drum with grooved spaces for the 1¼ in. hoisting cable. The snafting from the 300 h.p. motor is connected with the coupling, and is supported by Link-Belt ball bearings

W. G. Howe, Assistant General Superintendent, stands beside the regenerative monitor control at the top of the incline

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STRATEGIC and CRITICAL MATERIALS Output Gains Speed

● ***New and old mineral deposits are supplying important metals for war, according to a report to the Secretary of Commerce by Charles B. Henderson, President, Metals Reserve Company.***

CHARLES B. HENDERSON
President, Metals Reserve Co.

METALS Reserve Company, in cooperation with the Reconstruction Finance Corporation and Defense Plant Corporation, has been active in the domestic field of critical and strategic minerals effecting very large increases in production of bauxite, chrome, manganese, tungsten and vanadium. In the major nonferrous metal fields of copper, lead and zinc, necessary increases in smelting capacity in zinc have been effected; substantial increases in copper production made through the larger companies; and the production from the numerous and important small producers of all three metals greatly stimulated by payment of substantial premiums over "ceiling" prices for a period of two and one-half years from February 1, 1942. The following are some details of this program submitted by Charles B. Henderson, president, Metals Reserve Company in a recent memorandum to Hon. Jesse H. Jones, Secretary of Commerce.

Aluminum and Bauxite

Arkansas—Contracts have been been made with American Cyanamid and Chemical Corporation and with Reynolds Mining Company for production of 540,000 and 300,000 long tons per annum, respectively, of low-grade bauxite. Republic Mining and Manufacturing Company, a subsidiary of Aluminum Company of America, is proceeding with stripping operations preliminary to increased production, and with several small producers will supply the balance of approximately 840,000 long tons per annum required for the billion-pound alumina plant now under construction in Arkansas. Plans are proceeding for possible increase in production of high-grade bauxite in Arkansas to 2,000,000 long tons per annum, and for stockpiling any excess of current production over consumption. The above program represents a total increase of approximately 200 percent over 1941 domestic production of bauxite, and is scheduled to keep pace with increasing requirements for aluminum.

In addition, our engineers are making studies on the ground in Arkansas in connection with possible emergency production from Arkansas far in excess of the above program.

Antimony

Idaho—Negotiations are in process with Sunshine Mining Company for a

metal contract in connection with expansion of production at its new property from 30,000 pounds to 150,000 pounds of antimony per month. Discussions are proceeding with the Bradley Mining Company for possible production from the large low-grade antimony deposit surrounding its rich tungsten mine.

Texas—Contracts made with the Texas Mining & Smelting Company have permitted that company to make a large increase in imports of Mexican antimony ores, for metal production in Texas.

Domestic production of antimony continues to supply only a small proportion of domestic requirements.

Cadmium

The increase in facilities for electrolytic zinc production being made in Montana and Missouri, will permit the recovery of substantial amounts of cadmium contained in zinc concentrates.

Chrome

Alaska—A contract has been made for delivery of 20,000 tons of high-grade ore during the summer of 1942. Cooperation has been extended to the same producer for production of 400 to 500 tons per day of milling grade ore, and arrangements made to mill this tonnage in Alaska.

California—The Gray Eagle mill in Glenn County started operations in March, 1942, under arrangement with Reconstruction Finance Corporation and Metals Reserve Company, at the rate of 15,000 tons of metallurgical grade concentrates per annum.

California-Oregon — Arrangements have been made for purchase of chrome ores from small operators in truckload lots from the numerous small chrome deposits of northern California and southern Oregon. Stockpiles and sampling facilities will be available at numerous locations in this relatively inaccessible area.

Montana—A major development and production program is being carried out by Defense Plant Corporation and Metals Reserve Company, with Anaconda Copper Mining Company in charge of construction and operations. One mill went into operation March 1, 1942 on a basis of 60,000 short tons of concentrates per annum, and plans are under way for increasing present capacity by 150 percent before the end of 1942. Another mill is expected to be in operation before the end of this year on a basis of 150,000 tons of concentrates per annum, with the possibility of further increase in capacity in 1943. Still another property is expected to be in production at the rate of 60,000 tons per annum by the end of 1942. Prospecting and development of other areas will be carried forward this year as soon as weather permits. This production rate of 360,000 short tons per annum from these three Montana properties alone by the end of 1942 compares with the previous peak United States production figure of 92,400 short tons, achieved in 1918.

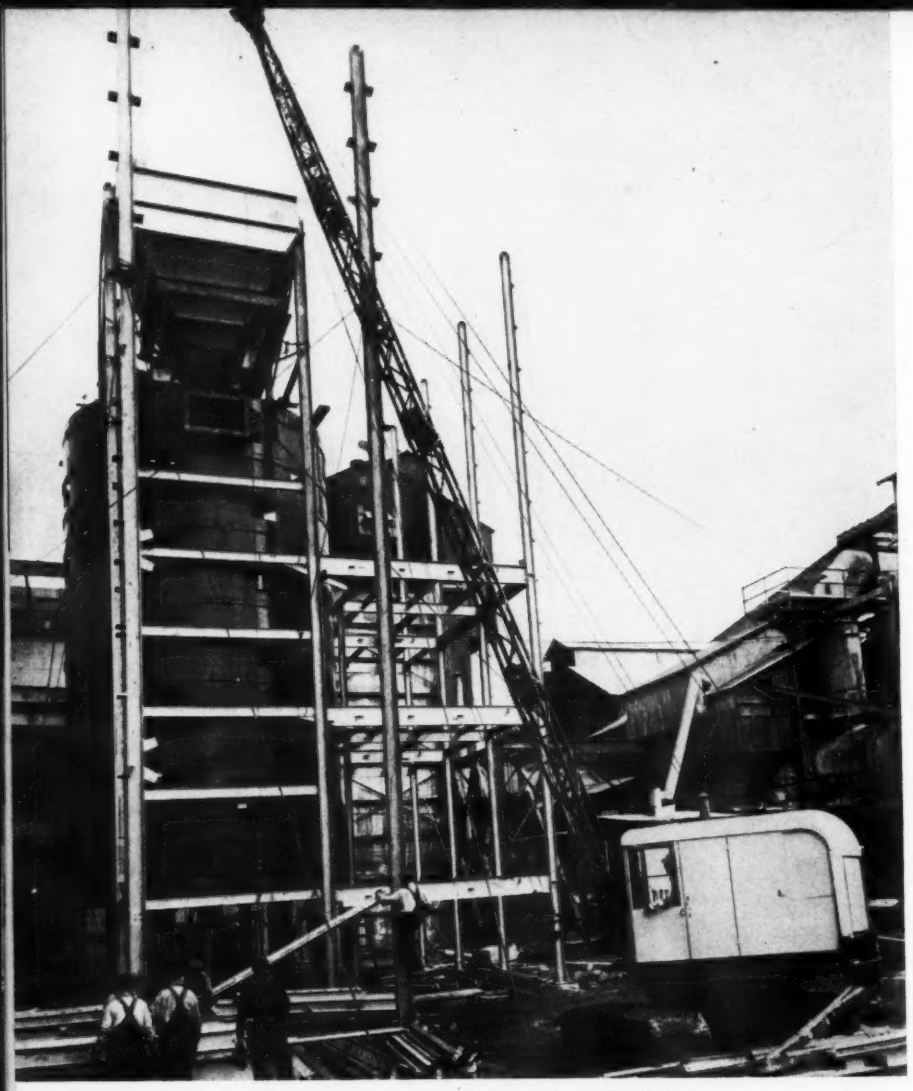
Oregon—A mill for recovering chromite from bench gravels is well under way, under contract to deliver 30,000 tons of chemical grade concentrates per annum to Metals Reserve Company.

Wyoming—Arrangements have been made for erection of a 400-ton mill by private interests involving production of 35,000 tons of concentrates per annum under contract with Metals Reserve Company.

Copper

At the request of the War Production Board and with the approval of the President, Metals Reserve Com-

Mercury from the Nation's largest producer



For more zinc and cadmium

pany has agreed to pay a premium of five cents per pound for "over-quota" production of domestic copper. It is expected that this will enable some mines to operate which could not operate profitably at the ceiling price of 12 cents per pound, and will permit numerous small individual operators to expand their production greatly.

Arrangements that have been made for expansion of domestic copper production are shown in Table I:

The aggregate increase in domestic copper production may well be 200,000 tons per annum.

Graphite

Reconstruction Finance Corporation loans have been granted to the four principal producers in the Alabama, Texas and Pennsylvania fields, and further investigations are under way in Chester County, Pa.

TABLE I—COPPER

	Location	*Production Tons Per Year*	*Government Capital Commitment*
Bagdad Copper Company	Arizona	10,200	$2,500,000
Calumet & Hecla Consolidated Copper Company	Michigan	1,250	.....
Gray Eagle Mining Company	California	6,800	.....
Miami Copper Company (DPC)	Arizona	23,000	9,000,000
National Tunnel & Mines Company	Utah	5,000	.....
Phelps Dodge Corporation (DPC)	Arizona	60,000	28,500,000
Total		106,250	$40,000,000

Lead

Arrangements have been made to pay a premium of 2¾ cents per pound on over-quota production of lead, for a period of two and one-half years from February 1, 1942. Substantial stimulation of small mine production may be expected to result from the premium price of 9.25 cents per pound, which is in excess of the highest average price level for lead in 50 years.

Manganese

Arizona—The owners of the major portion of the large manganese reserves in Arizona are carrying out experimental work in a large pilot plant, and will submit preliminary plant designs and cost estimates with the view of entering into the necessary contracts with Defense Plant Corporation and Metals Reserve Company to bring this large property into production.

Arkansas—Arrangements are being made for construction of a concentrating plant of 300 to 500 tons daily capacity.

Minnesota—The production of manganese from the "black ores" of the Cuyuna Range has been dependent upon the satisfactory solution of the metallurgical problems involved. After six months of pilot plant operation conducted under the auspices of Metals Reserve Company, it has been decided to use sulphuric acid leaching for this ore. Negotiations are proceeding for erection and operation of plant and for ore delivery for a plant of 200,000 tons per annum of 60 percent manganese nodules.

Montana—Anaconda Copper Mining Company is now producing for Metals Reserves Company high-grade manganese nodules (60% Mn) from its beneficiation plant at the rate of 112,000 short tons per annum, and is making plans for increased production under its contracts to deliver to Metals Reserve Company. Arrangements are being made for construction of a concentrating plant in the Phillipsburg area.

Nevada—At the Three Kids property, Manganese Ore Company is proceeding to erect and operate a leaching plant under contracts with Defense Plant Corporation and Metals Reserve Company. This property should be in production before the end of 1942 at a rate of 110,000 short tons per annum of high-grade sinter (63% Mn), at an expenditure for milling facilities by Defense Plant Cor-

poration of approximately $5,500,000, and of $2,250,000 by Manganese Ore Company for property, mining facilities and preliminary stripping. It is expected that the above facilities may be expanded in 1943.

Arrangements are being made to provide milling facilities for the manganese deposit in other Nevada areas.

New Mexico—One company is now operating a small mill, and a second company designing a mill of 250-300 tons daily capacity. Both of these companies have contracts with Metals Reserve Company for sale of their production.

South Dakota—The problems of the great low-grade Chamberlain deposit are (1) the recovery of nodules from the shales of the district, and (2) the conversion of these nodules into ferromanganese. For the first problem, steps are being taken to produce approximately 300,000 tons of 16 percent nodules per annum, which will either be stockpiled for the present, or blended with high-grade concentrates if required.

Utah—Metals Reserve Company has concluded a contract with the owner of the principal ore area, who proposes to erect his own concentrating mill.

In addition to the above, Metals Reserve Company has made 50 contracts for manganese production in 13 states.

Mercury

Production of mercury has increased so rapidly both in the United States and Mexico under stimulation of price that no steps have been taken, nor are contemplated at the present time, for any substantial government financing.

Mica

A program is being evolved for establishment of buying offices in the principal producing centers of the domestic mica industry.

Tungsten

Contracts have been made with three of the largest domestic producers of tungsten to permit substantial increase in their production, and similar contracts are being arranged with numerous other producers. A retreatment plant will be erected this spring in Utah which will permit the utilization of large tonnages of low-grade concentrates, much of which has hitherto not been recovered. Arrangements are being made for direct purchase of production from small producers. With the stimulation of a price of $24 per unit (of 20 pounds) and of the above measures, it is expected that domestic tungsten production will increase from approximately 6,500 tons in 1941 to a rate of approximately 19,500 tons by the end of 1942.

TABLE II—ZINC SMELTING PROJECTS

	Location	*Added Capacity Short Tons Annually*	*Financial Commitment*
American Smelting & Refining Co.	Texas	25,000	None
American Zinc, Lead & Smelting Co.	Missouri	20,000	$4,500,000
Anaconda Copper Mining Co.	Montana	45,000	None
United Zinc Smelting Co.	West Virginia	14,400	750,000
Total		94,400	$5,250,000

Vanadium

Arrangements have been completed for the rapid development of several of the lead vanadate properties in the west, which were of no economic interest under normal conditions. A program is being developed for increasing the production of vanadium from the sandstone ores of western Colorado and eastern Utah. These two steps should result in an increase of about 60 percent in domestic vanadium production as compared with 1941.

Zinc

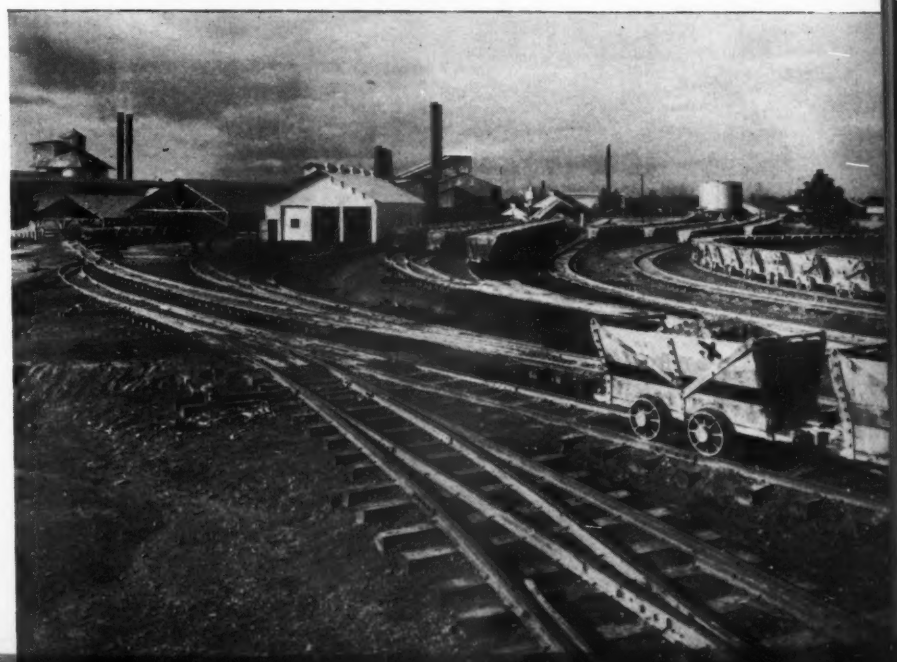
Expansion of domestic zinc smelting facilities has been effected by Metals Reserve Company through contracts for the purchase of production or through agreements to make the necessary concentrate productions available, on the projects, shown in Table II.

Through arrangements for continued supplies from foreign sources and through stimulus to domestic zinc production by the payment of a premium of 2¾ cents per pound for "over-quota" production, concentrate supplies should be adequate to utilize existing smelter facilities and those made available by the program outlined above.

Salvage and Scrap

In addition to the steps enumerated above in respect to production of strategic and critical ores and metals, Metals Reserve Company has taken steps in cooperation with the War Production Board for the requisitioning and reclamation of semi-processed materials which have been frozen by order of the War Production Board, and of numerous classes of scrap, such as automobile "graveyards," which cannot move into consuming channels by ordinary business procedure.

Aluminum from domestic bauxite deposits



"CALLING ALL SCRAP METALS"

● ***Mine operators everywhere are urged to segregate and clean up any scrap piles, and quickly get all metal junk into the flow of supplies for Planes, Guns and Ships.***

By GEORGE T. WEYMOUTH
Chief, Industrial Salvage Section
War Production Board

BY way of introducing the important subject of industrial salvage it is important to review a few facts and figures covering the need for raw materials and scrap by the industries engaged in producing war supplies.

For the manufacture of the implements of war—planes, tanks, ships and guns we must have enormous supplies of metals. The Victory program laid out by the War Production Board means a continuing and increasing drain on our raw materials which must be supplemented in every known way possible.

Last year the nation produced over 80,000,000 tons of steel. Only a quarter of this was for war and lend-lease use. This year the need is for more than last year's output. War needs for 1943 are estimated to be several million tons.

The only way to solve this whole production problem is to get into the flow all the scrap out of which raw materials can be produced. The critical materials most urgently needed today are—iron and steel scrap; nonferrous metals, such as aluminum, copper, brass, zinc, and manila rope, rubber, burlap, waste paper and cotton and woolen rags. Under normal conditions, iron and steel scrap supplies about one-half of the steel produced. In order to produce the required tonnage of steel many tons of iron and steel scrap is required.

The four branches of the Bureau of Industrial Conservation are (1) Simplification, (2) Substitution, (3) Specification and (4) Salvage. The first two are more or less self-explanatory. Specification applies to the regulations employed by the Government in the purchase of all materials. The fourth and last branch is the Industrial Salvage Section, with which we are mostly concerned. The operations of these four branches comprise the entire activity of the Government for conservation.

The Salvage Section is divided into four separate operations: Industrial—General, or household, which handles the removal and disposal of scrap materials from homes, retail stores, farms, garages and the like—Automobile graveyards—and Special Projects. The last mentioned, Special Projects, deals with unusual problems, such as buried rails, abandoned buildings, properties containing scrap materials, ownership of which is in legal hands or unknown.

Our particular function is Industrial Salvage and we are concerned with promoting the flow of all scrap materials—all kinds and types—from all manufacturing plants and establishments, mines, mills, public utilities, railroads and oil wells. This applies to scrap generated in the process of manufacturing, and also scrap which can be realized from the wrecking of obsolete and abandoned machinery from unusable stocks, dies, parts, etc.

Specialists Are Experienced Men

The Industrial Salvage Section was set up and staffed with several specialists, thoroughly experienced in salvage operations of all phases. The objectives of the section are:

1. To educate industry to salvage all critical waste materials.

2. To speed up the return of these materials into the bloodstream for war production purposes.

3. To advise and help industry to use established channels in disposing of these waste materials.

An all-out campaign, whereby every industrial organization will be reached, has been placed in operation, and to the accomplishment of our objective, namely, to get every ounce of needed material moving, we are definitely committed. The salvaging and collection of scrap is a normal procedure in business and industry. However, we all know now, that normal sources of scrap cannot deliver the quantities needed to fulfill the demands of the war program. Several industries, such as automotive, that have supplied scrap in large amounts in the past cannot continue to do so, as they are now engaged in 100 percent war production of planes, motors, tanks, ships and guns.

Probably our greatest problem has been to get the top executives of industries of the country to recognize that the matter of salvage is a serious problem. We have to get this story across to men who can make immediate decisions and take action most quickly. We must persuade heads of companies to give to purchasing agents, to salvage managers, to plant superintendents, not only the responsibility of salvage today, but the authority to do the job as well. Our experience has indicated, that at this time, the principal failure of scrap materials to be located and moved has been that the authority and responsibility has not been placed with the proper committee or individual.

Very simply stated, the assignment of the Industrial Salvage Section is to

get the attention of every president, of every shop foreman, of every workman in every plant in the country to the crying need today for the many materials mentioned previously. We have tried to concentrate as the tide changes on those that are at the moment most critical.

It is true that in certain localities, for price reasons or other, there is no shortage of some of these materials, but in the aggregate these materials are vitally needed. In some cases there is no actual shortage but a dislocation.

The spotting and movement of scrap to the mills is the only way we have discovered that we know of to augment the great deficiencies of certain raw material supplies today. We estimate that for the year 1942 there is an iron and steel shortage of some 6,000,000 tons. Many open hearth furnaces have been shut down due to shortage.

Scrap Shortage Holds Up Steel Production

Following a talk presented in the west a few weeks ago, the president of a steel company announced, and I quote, "In this area there are four furnaces down, not for repair, but because there is a shortage of iron and steel scrap. These furnaces have a total capacity of 700 tons per day. In the building of a 10,000-ton cargo ship, many tons of iron and steel scrap are needed. We manufacture steel plate for those cargo ships. At this rate every three days a cargo ship is lost, which means in bald figures that my company alone is unable to provide steel plate necessary for building cargo ships on a yearly basis. We certainly need iron and steel scrap urgently."

What we ask you to do is nothing new. We ask you to scrutinize the problem thoroughly. Go through your plants and mining properties and give them a real old-fashioned house-cleaning. See if there is some obsolete equipment that can be junked; equipment and stocks that you will never use again. Look in your yards and see if there is dormant scrap, hitherto disregarded; demolish old machinery or if it is still usable and you don't need it, move it where it can be used. Look into your store-rooms and ask yourselves if you are holding back some materials that could be used by the other fellow, who needs them sorely.

A short time ago, at the instigation of this section, a large steel mill followed this simple action, and as a result has adopted the slogan—"What we aren't using now, we'll never use—junk it." In two months time 125 carloads of iron and steel scrap were turned into their own mills—125 carloads over and above normal movement.

Splendid Cooperation from Companies

I mention a letter from a company that has what is recognized as one of the best plant salvage operations in the country—The General Electric Company. They took us seriously and are doing a real job, one that we regard as a real patriotic contribution to the War Production Board. I read the letter from Mr. C. E. Wilson, quote, "You requested me to take up with our factories the matter of dormant scrap. We did this some weeks ago, but it takes a little time to get organized. To date we have uncovered 1,211 tons of dormant scrap, 90 percent of which is steel and 10 percent non-ferrous metals. We feel quite certain that by March 13 we will have uncovered a total of 5,915 tons from all our plants. You may be interested to know that we have appointed several men in each factory to inspect every building thoroughly and that we are in process of scrapping some boilers which we have been holding for a number of years. I wish to assure you of our enthusiastic cooperation in this whole matter."

On March 7, we received another letter to the effect that General Electric had not quite made its objective, reporting, quote, "slightly under the 5,915 tons originally estimated, 5,850 tons to be exact, but we are continuing the program and will do everything possible to go well over our original objective." That is what we call real cooperation and following the ball.

Here is another letter from the president of the Goodyear Tire & Rubber Company, which I offer as an indication of what can be done. I quote from Mr. E. J. Thomas' letter, "I think, however, that you will be pleased to know that upon my return I placed this problem of salvage up to the organization to do a real job within our own plant. We have always tried to keep the situation in hand and scrap everything possible, but in this case I asked for an all-out effort, to stop holding these things at all.

"I am pleased to report to you that the organization has just reported to me that this week they have collected everything and have decided on scrapping out in machinery, old molds, etc., 3,200,000 pounds of metal scrap."

We have received hundreds of reports such as these—reports which have been sent to us voluntarily, describing in detail, tons and tons of materials moved into the flow, which otherwise might still be laying around plants and not put to use.

I am not at liberty to divulge the names of these companies reporting, but I would like to give a brief description of a few, as follows:

1—A railroad operating not so far from Cincinnati, reports 14,195 tons of iron and steel scrap, 46½ tons of non-ferrous and 168 tons of waste paper.

2—A pulley manufacturing company—"in January we moved out 59,650 lb. of dormant scrap."

3—A Chamber of Commerce in Texas—"following our drive, we turned over in scrap iron 6,893 tons in January and 8,243 tons in February."

4—Another report from Texas from a most active association in the area—

Scrap metals gathered at mines will contribute to collections like this

first report for two weeks, 11,000 tons of iron and steel scrap—reported again two weeks later an additional 16,000 tons and "still going strong."

5—Another railroad sends in a complete report by classification and the companies to which the scrap was sent —total iron and steel scrap—3,448 tons—16¾ tons brass—2½ tons copper and 25 tons of miscellaneous nonferrous.

6—A utility company in the south —"During the month of February we moved 65 tons of iron and steel scrap; 2½ tons of copper and a small amount of aluminum."

7—A large utility company in the middle west—from abandoned power houses and dormant scrap we moved 8,400 tons of iron and steel scrap and three tons of copper.

8—A well-known automobile company—"for your record we are reporting the movement of critically needed materials which we collected during the month of February—aluminum 89,784 pounds—brass, 56,507 pounds—iron and steel scrap, 1,148 tons—waste paper, 81 tons and zinc, 3½ tons.

I cite these to give an example of the all-out cooperation we are getting from all kinds of industry. If we can get the whole-hearted understanding and support of each and every business man in the country today—there'll be no shortage—there'll be no question about filling the requirements of the War Production Board, and there'll be no question as to who will win this war.

Permit me at this point to describe briefly the method of operation the Industrial Salvage Section has put into being. We have approached the solving of this problem in four directions:

1—Through Industrial Centers—We have established regional headquarters in nine different areas, which cover the entire country. These areas have been set up for the most part industrially and not geographically. For example, Philadelphia has a regional office and controls all of Pennsylvania, Maryland, Delaware, West Virginia and part of New Jersey. Mr. Merritt Simpson is a regional director. He has a staff of field men, who cover all the industrial communities in this region. They set up meetings for the formation of steering and executive committees, which represent every active industry in that particular area. The members of these committees carry through the program to their own particular industry and are personally responsible for putting the salvage program in effect. Of course they receive the constant aid and advice of the Industrial Salvage Section and regional men in the field. To date there are more than 100 Industrial Center Organizations in operation. Specially selected salvage men have been appointed in practically every plant to keep our program in motion, not for just a week—a month —but from now on.

2—Through Industries Vertically—industries such as coal, petroleum, public utilities, textile, railroads, etc. We have on our staff in Washington about 12 men, each one directing the program in his particular field throughout the country, with the aid of the regional men and committeemen of the industrial center organizations.

3—Through Trade Associations. Nearly 200 trade associations, through their executives and secretaries have cooperated with the program in every way possible.

4—Through Governmental agencies. The Army and the Navy Departments have organized a salvage pro-

(*Continued on page 49*)

All types of scrap metal are needed

+ + +

INDUSTRIAL SALVAGE SECTION

Regional Headquarters and the States They Serve

San Francisco, Calif.

A. H. RICHARDS, *Regional Director*
573-1355 Market St.

Washington	Montana
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Tackling the Mine Personnel Problem in Wartime

The up-grading of available men in the mining industry is an educational problem, requiring cooperation between employer and employe.

By G. R. SPINDLER
Assistant Director
Mining Extension Department
West Virginia University

PROBLEMS that arise in the operation of any industry are so numerous and diversified as to defy their group solution by any simple formula or practice. The mining industry is no exception. Upon analysis it is surprising, however, to discover how many of these problems and difficulties have their origin in personal failures and deficiencies that can be prevented or remedied only by training the individual workmen in the arts and skills of their particular jobs. It is recognized that personnel training cannot be considered to be a cure-all for all industrial ailments and the selection of such training as a major remedial measure does not make the problem a simple one. First, a personnel training program must assume all of the ramifications and diversities that are incident to the production activities and vocations of the industry in question, and that fact alone as applied to the wide range of vocational activities in coal mining makes an effective training program somewhat complex, even in time of peace.

For a long time leaders in the coal industry have recognized the need for comprehensive personnel training programs as necessary adjuncts to the rapid mechanization of mining operations. It is true, that during recent years there has existed a surplus of labor of all classes, skilled, semi-skilled and unskilled, but that period was one of keen competition and low market prices for the coal mining industry. Competition and the low product values, coupled with rising wage scales, could be met only by the development of new methods and higher unit efficiencies. Mechanization of the mining operations transformed the coal industry to one of almost entirely skilled or semi-skilled labor with production and costs dependent upon the performance of section or crew units rather than upon individual workmen.

Those factors focused the attention of many mining men upon the development of personnel training programs together with more critical selection of employes as aids in the struggle to keep the cost of production below the level of market values. Early attention to personnel training and employe selection is bearing fruit today when the coal industry, as is true of many others, is faced with a very serious problem obtaining adequate labor supply, in war time.

Coincidental with the requirement of more coal to meet the fuel demands of war production, the coal industry is confronted with the loss of thousands of its trained and experienced employes to the armed services and to other industries. Replacements of similar skills and experience no longer can be recruited from the unemployed, which just a few months ago constituted an apparently inexhaustible reserve.

Unfortunately, the losses and shortages of skilled workers cannot be met completly by the advancement of remaining personnel with at least basic experience. The shortage exists in almost every bracket and level of mine employes, ranging from the lower skills to the highest and covering virtually every mining occupation. Therefore, replacements must be made with new and frequently totally inexperienced workers and the problem solved by quickly and effectively upgrading employes with basic experience and the training of new and inexperienced workers. The situation is acute at the present time and can be expected to become more so as time passes. The problem is serious and demands the immediate attention of every mine manager.

In making a logical approach to the development and conduction of a mine personnel training program for any mining operation, there are certain questions to be answered. Since many of the specific problems are local, any general coverage of those questions is necessarily incomplete. The following, however, may be considered to be sufficiently broad to be generally applicable.

1. What are the objectives of the training program?
2. What persons or employe groups are to receive special training?
3. What training is to be given to each of the selected groups?
4. Where, how and by whom is the training to be given?

Objectives of the Program

The decision to institute a personnel training program is frequently motivated by an unsatisfactory accident record, production or preparation difficulties, changes in operating practices and methods requiring new or special techniques or skills, or, the present existing or potential personnel shortages due to the war.

In any case it must be recognized that both employer and employe have definite responsibilities in the operation of the program, which by the same right implies that both groups must share in the opportunities for benefits. The training program must be educational in nature and of such order that the employe clearly recognized the opportunity for his personal improvement resulting in the advancement of his earning capacity or general wel-

fare. The voluntary support and cooperation of the employe groups are essential to the success of the training effort. This can be obtained or expected only when their personal benefits and rewards are clearly in evidence. Too often a socalled personnel training program develops into the recitation of imposed rules or practices without much treatment of their reason, source or justification. Safety and accident prevention programs have been common offenders in that respect.

Mining men are at the moment concerned with the alleviation of an existing or potential personnel shortage which may or may not be of long duration. In general, however, the problem of personnel training should be approached on the basis of a long-time viewpoint directed towards the continuous improvement of men and methods to keep pace with the ever-advancing trends of industrial progress. It is doubtful if we ever can assume to have reached a goal or a climax in such a program but should point toward continuous and progressive employe training as a permanent project.

Opportunity Ahead For Persons Selected For Training

Obviously if a general personnel training program is to be completely effective, all employes should be included. It is true, however, that all employes do not require the same type of training and it is necessary to recognize the capacities and limitations of the individuals. Some of the employes will be taught only the arts of the proper performance of task assignments with the training conducted largely or entirely on the job and the supervisory personnel serving as instructors. Other groups will require special and advanced training in the theory and practice involved in the performance of their work. The opportunity for occupational advancement should always be present as the incentive for the employes' participation and the training made available for any person should be determined by the person's capacity to profit from the training given rather than upon his immediate employment.

In general, the mine personnel training program can be subdivided according to the following employe groups:

1. Supervision.
2. Mechanical maintenance and operation.
3. Technical and semi-technical apprentice.
4. Crew workers—job training.

It is not possible to avoid a certain amount of overlapping in such a classification and some of the training given will be common to all groups.

The Foreman Must Make Decision

The provision of an adequate supply of qualified foremen and minor officials constituted one of the earlier objectives of organized training programs for coal mine personnel. That is true in West Virginia, where the Mining Extension Department of West Viriginia University has been conducting such programs throughout the coal mining sections of the state since 1913. That program has been directed primarily toward the training of supervisory personnel and has accounted for a cumulative enrollment of 36,000 men during the 29 years of its operation.

Since the instruction of the working crews must become, to a large degree, a function of the supervisory forces, the training of the foremen and other supervisory officials must become a first step in the general personnel training program. The foreman is recognized to be the key influence in the production schedule and in a great majority of cases, improvements in production, costs and safety records revolve about the single factor—better supervision. While specific job training or instruction in job procedure may be sufficient for certain of the crew workmen, that is certainly not true for the foreman. The foreman should have a thorough understanding of the fundamentals and basic technical principles involved in the performance of all the activities under his supervision. He is charged with the responsibility to make decisions and must be able to quickly and accurately survey a situation and arrive at a decision on the basis of the principles involved. The faculty and habit of observation together with the ability to analyze conditions and anticipate results are important working tools for the foreman.

With those points in mind, it is evident that the inside foreman must be well grounded in the basic technical principles and practice of the various phases of coal mining. Consequently, the foreman should receive rather thorough training in such basic mining subjects as ventilation, mine drainage, haulage, timbering, systems and methods of mining, and other fundamental mining operations. With these fundamentals as a background, a wide range of subjects having specific application to his duties as a foreman and to the supervision fall into a natural sequence, as:

Studying hydraulic controls in a mechanical maintenance class

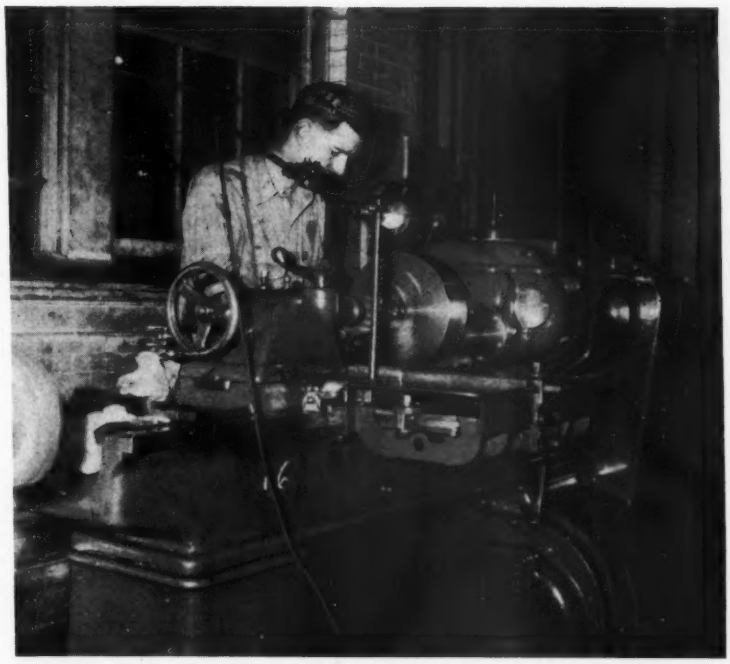
Foremanship—principles of supervision, employer-employe contracts, job analysis procedures, personnel selection, safety and accident analysis, and teaching methods.

Mechanical Mining Methods and Systems—a general study of the methods and systems in use and the results obtained, a thorough study of the equipment and methods under his supervision or in use at his operation.

Production Analysis—crew organization, operating cycles, time and motion studies, cost analysis.

Special Subjects—mathematics, mining electricity, principles of mechanics.

The subjects named do not exhaust the field but serve to indicate the wide range of study desirable for the supervisory groups. It should be kept in mind that the training offered is strictly vocational in nature and all subjects should be covered in such manner as to stress the practical applications. The instruction in all cases should be given by men of considerable experience in coal mining and well versed in the theory and practice of the particular phases under discussion.



Vocational trade schools provide a potential supply of shop and maintenance mechanics as well as provide further training for employed workers

Maintenance and Operation of Mechanical Equipment Must be Understood

Correct mechanical maintenance and the proper operation and care of mechanical equipment as aids to keeping equipment in working order and in operation have assumed new roles of importance with the increased mechanization of mining operations. Under present conditions, when machine replacements and repair parts are difficult to obtain and delays in delivery are almost inevitable, the mechanical maintenance problem takes precedence over almost all others. Maintenance becomes a matter of upkeep and care in operation rather than mere provisions for making repairs. With that in mind, it is not possible to completely separate the duties and responsibilities of the maintenance mechanic from those of the machine operator or the foreman in charge. In the conduction of a training program there must be enough overlap in the instructional fields for the various groups to inculcate a sense of mutual responsibility and a joint appreciation of the problems of both production and maintenance.

Here again the training field is broad and is limited only by the needs and capacities of the student groups. For some of the maintenance employes whose duties are somewhat routine or repetitious, "on the job" training may be sufficient. For the maintenance foremen and others in key positions a more intensive training program is desired.

During the past two years the Mining Extension Department of West Virginia University in cooperation with certain mining companies in the state has conducted special classes for maintenance mechanics, machine operators and foremen. Classroom and shop facilities as well as equipment for demonstration and shop practice have been provided for the most part by the participating companies. Selected students attend the classes for approximately four hours per week for periods ranging from nine to 32 weeks. The work is about equally divided between shop practice and classroom study of related subjects, with special attention to electric circuits and controls in both cases. The fundamentals of good maintenance procedure are stressed throughout the work, including such points as safety, knowledge of equipment, inspection procedures and policies, lubrication, the selection and care of tools, cleanliness, orderliness, importance of standard parts, quality workmanship and cooperation with other workmen and departments.

For men desiring such work, classes are also conducted in such subjects as Principles of Electricity, Power Transmission, Electrical Equipment, Applied Mechanics and Mathematics.

Technical and Semi-Technical Apprentices Offered Wide Choice of Jobs

Many mining companies have found it profitable to provide an organized or systematic training program for new members of their technical staffs. The students in such groups are usually young men recently graduated from college or high school and frequently just entering their first industrial employment. The training consists in part of scheduled rotation of the student from one department to another in order that he may develop a knowledge of the problems and conditions of each. Thus the student will, over a period of time, receive experience in every phase of the mining operation as production, transportation, preparation, maintenance, cost analysis, time study and engineering. The student is under observation and supervision during the entire time of his training period and at its completion should be in a position to make a choice of his employment field or be placed in that field for which he is best fitted. For those not having the benefit of previous technical education, a supplementary training program covering the essential technical fields must be provided and a similar supplementary program is desirable even for those having such previous education. The young graduate engineer, for instance, has received sound training in the

fundamental engineering sciences, but he will probably not have his training and information correlated with the conditions and applications of his new field of employment.

It has been recognized for many years that the supply of graduate engineers with training in mining has been far short of the needs of the industry. That condition is not improving very rapidly and at the present time is even more serious since many graduate engineers, some with several years' experience, have been called into the armed services. It is suggested that in conjunction with their technical apprenticeship programs, mine managers can well direct some attention to the encouragement of desirable young men in their respective communities to enter a recognized college or university to study mining engineering. The need for technically trained men in coal mining is constantly increasing and some direct action should be taken to assure an adequate supply.

By far the larger part of the actual instruction comprising a mine personnel training program will be given on the job to the individual workers. Instruction in job performance and manipulative procedure cannot be satisfactorily given in any other manner. That premise does not in any sense discredit the importance of the job training part of the program. In fact, since a larger number of employes and more of the actual production activities are involved, it can be considered to be the most important phase of the entire training program. The results of the program will be measured by the extent to which the job-training of the individual workmen is effective and complete. It is, however, a phase of the program which must largely be conducted by the foremen or supervisors in charge of the crews or workmen. Much of the special training given to those foremen and supervisors has been directed toward the development of their abilities as instructors.

Training Sources Must Be Adequate

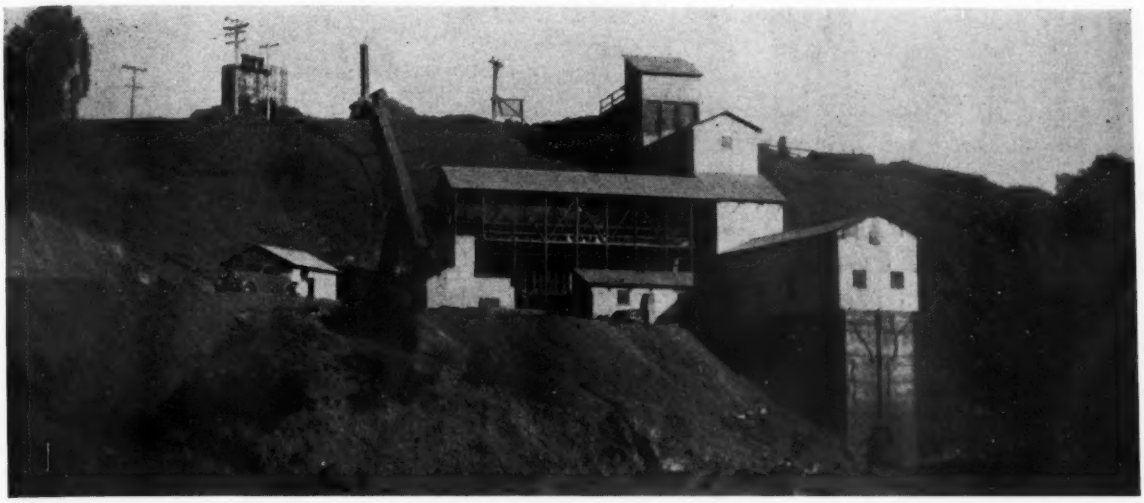
In most coal mining states there are certain public agencies which can be called into service or utilized in the conduction of at least certain phases of the mine personnel training program. Where such services are available or can be provided, it is suggested that they be utilized insofar as possible in the interests of economy as well as efficiency. While in the complete program certain phases of the instruction become the proper function of the operating company, certain other phases, especially those involving general principles or basic fundamentals, can often be handled to better advantage by an outside agency. Instruction under the direction of such public agencies should be given by persons specially trained in the art of teaching and likewise well grounded in the theory and application of the subject at hand. Classes under the direction of the public vocational education agencies can usually be conducted on the company property if desired and can ordinarily be made available without expense to the students or to the operating company. Funds in the form of Federal aid supplemented by appropriations by the state or local governments are made available through the provisions of the Smith-Hughes Act of 1917 and the George-Deen Law of 1936. In each of the respective states these funds are administered by and the programs are under the direction of a designated state agency, usually a division of the State Department of Education. In other cases, special state appropriations to established mining schools make the same services available. In West Virginia the programs are offered jointly by the School of Mines of West Virginia University and the Vocational Division of the State Department of Education.

Vocational high schools and training centers are to be found in the majority of industrial centers and under the impetus of special training programs established to provide skilled workers for defense industries, more are being provided. These schools can be used as a source of new employes with basic training in the arts and skills of the various trades. Young men with good fundamental training and considerable practice in such work as machine shop operations, welding, woodworking, drafting and others of the skilled trades are good prospects for mine employment. These shops are also available in most cases for the conduction of evening or part-time classes for employed workers.

Instruction Involves Job Training

Some of the larger mining companies have established within their own organizations complete training programs with instructors employed for that purpose, but in even those cases the public agencies are incorporated into the plan for as much assistance as possible. In general it may be assumed that instruction involving job training, specific manipulative practice or company policy becomes the proper duty and function of the company although such training in relatively narrow fields cannot be considered to displace or substitute for the broader training in fundamentals and sciences as recommended for supervisors and key employes. In all cases and in all phases of the work, it is essential that the management give its full cooperation and support. It is necessary for the company to take the initiative in making the training available as well as providing the incentive for the employes' participation.

The Mineral Industries Building at West Virginia University which will include special provisions for vocational training of coal mine employes is expected to be completed in the near future. Dedication is scheduled in October



Low grade quicksilver ore is hauled by trucks from the open cut workings and brought to the reduction plant. Here, the fumes from the burned ore pass through a series of condenser tubes where the quicksilver is collected. The gases then pass up through the long flue to the stack

NEW ALMADEN—An Old Mine Being Modernized

The property has supplied quicksilver during critical times since its discovery in 1824. Today, the reduction plant recovers mercury from low grade ore and extensive underground development is under way.

By C. N. SCHUETTE
Mining Engineer
San Francisco, Calif.

IN 1824 prospectors found the New Almaden quicksilver mine, which ranks first in total output among the nation's quicksilver mines and fourth on the roster of the world's mercury producers.

Aside from minor operations by licensees working over old dumps, it was idle from 1926 to 1940. In that year the New Almaden Corporation was organized and obtained a lease on the property which is about 12 miles south of San Jose, Santa Clara County, Calif. This lease went into effect on May 1, 1940.

Buildings used by former CCC men on the property were rebuilt into a camp and early in June of that year exploration by open cut methods was under way. By August the results of this exploratory work were sufficiently encouraging to warrant construction of a reduction plant. Work on this project began in mid August and operations started in mid November and has been maintained ever since. Underground work was started in May, 1941, and in October of the same year the New Almaden Corporation declared its initial dividend.

The mine property extends along a ridge of hills in a northwest direction for a length of 4½ miles. The width of the property is one mile at the northwest end and two miles at the southeast end where Mine Hill, some 1,760 ft. high, dominates the scene.

Most of the production has come from workings in Mine Hill which have been extended a depth of 2,450 ft. below the top of the hill. While many separate ore occurrences have been mined in this area, they are all

genetically related and in general are found along the contact of a hump of serpentine and overlying sedimentary shales and sandstones. The rock in which the ore occurs belongs to the Franciscan Formation in which most of the California quicksilver mines are found.

Northwest of Mine Hill, along the ridge, are the so-called outside mines known as the America, Providentia, Yellow Kid, Jr., Enriqueta, San Antonio, San Mateo and Senator. These are all prospects at present, though the Enriqueta produced about 10,570 flasks before 1863 and the Senator mine produced over 20,000 flasks from 1910 to 1926.

Across the end line of the property from the Senator is the Guadalupe mine, which is the fifth largest mine in the United States in point of total production to date. New Almaden has produced about 1,043,500 flasks of quicksilver and Guadalupe 110,000 flasks. Therefore, this 5-mile ridge of hills has produced 1,153,500 flasks of quicksilver which makes it important among the metal producing districts of the United States.

Reopening an old mine is a long, tedious and expensive process of uncertain outcome. For this reason, it was planned to bring low grade outcrop areas into production first.

Low Grade Ore Yields Profit

This outcrop ore, won by open cut methods, and old dumps, can be handled and treated at low cost and yields enough profit to carry the slower underground work of rehabilitation and exploration. The latter, however, is expected to yield a higher grade of ore.

The main open cut at present is directly on the top of Mine Hill, which has been lowered about 25 ft. in the digging process. A second open cut has been started on the outcrop of the Cora Blanca mine at the head of Deep Gulch on the east slope of Mine Hill.

In 1941 these open cuts and old dumps yielded 33,795 tons of 3½ lb. quicksilver ore from 347,419 tons of material moved. Thus, over 10 tons of waste were moved for each ton of ore.

Digging is done by three Bucyrus-Erie 20-B, ¾-yd. diesel shovels and a fleet of ten 5-ton Mack dump trucks haul the ore. A Caterpillar D-7 Angle dozer helps in the mining and builds the necessary roads. About 3 miles of new roads have been built so far and some 7 miles of road must be maintained to carry on the work. A leaning wheel road scraper is used to smooth the roads and maintain the ditches.

Diesel powered shovels of ¾ cu. yd. capacity are used in the surface operations. A fleet of 10 5-ton trucks haul the ore to the plant

The Mine Hill open cut consists of a series of benches 25 ft. high. The 25, 50, 75 and 100 ft. benches are being exploited, and on the 125, 150 and 200 ft. levels preliminary road cuts have been made.

Shales, sandstone, serpentine, "quicksilver rock" (hard altered silicified serpentine), stope fills, caved ground and timbered ground is encountered. "Selective mining by power shovel" is practiced with surprisingly good results and costs in this accumulation of material. Dumps are also mined as selectively as possible and, thus far, no sorting or screening has been done though the possibilities of these methods are being studied.

Open cut mining is virtually impossible during the rainy season as mud prevents distinguishing between ore and waste. Therefore, ore is stock piled in the dry season at points close to the plant. The practice employed is to send alternate truck loads of ore to the plant and to the stock pile so that the daily plant returns indicate the metal content of the stock pile. This method of "assaying" the ore has proved reliable. The conventional methods of sampling and assaying are undependable due to the well known difficulty of obtaining representative samples in most quicksilver mines.

Two Ingersoll-Rand portable compressors, a 210 and a 315, are used for drilling on the surface employing S-49 Jackhamers. Little blasting has been found necessary in surface mining thus far.

The ore from the dumps and open cuts is trucked to the plant and dumped on a grizzly with bars spaced 1½ in. It is set on the rear half of a divided 150-ton bin. Fine ore passes

Shop buildings and truck sheds are in the foreground. Long dark buildings in the rear are living quarters, formerly occupied by a CCC unit

through the grizzly into the back half, where a chute delivers it to a short belt conveyor which brings it to a 175-ton fine ore or furnace bin. The coarse ore passes over the grizzly and drops into the front half of the bin, from where it is fed into a 10 x 16-in. Blake type jaw crusher. The crushed ore drops to the same belt conveying the fine ore that goes to the furnace bin.

Ore from the fine ore bin, up to 3-in. flat slabs in size, flows through a chute to an inclined bumping pipe which feeds it into a rotary kiln. The kiln is 5 ft. in diameter and 60 ft. long. It is set on a slope of ¾-in. per foot and revolves at 1 r.p.m. It is lined to a thickness of 7 in. with a monolithic lining of burned rock, crushed fire brick (in lieu of sand) and Lumnite cement. The kiln is oil fired, through a low pressure Staples & Pfeiffer burner. The fire box is stationary and so arranged that the front steel cover can be removed. The removal of a part of the front brick wall under a false arch then gives an opening large enough to allow wheelbarrows to be run into the kiln on relining jobs. Highest thruput, thus far, has been 140 tons per day on dry ore but the monthly average is about 100 tons per day.

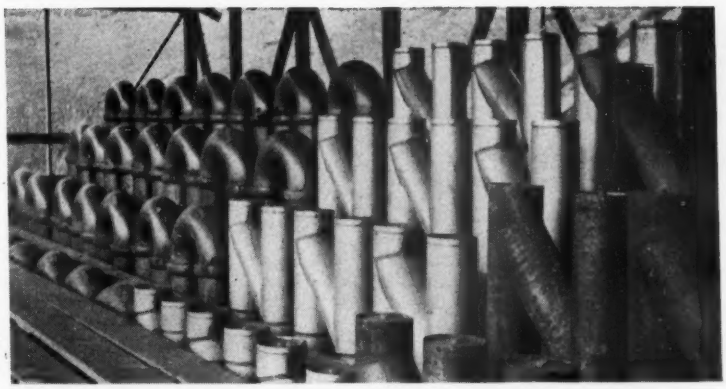
Three Types of Pipes Used in Condenser System

Burned ore from the kiln drops into a brick lined concrete soaking pit which holds a two shift discharge so that the rock needs to be drawn out on one shift only. An arc gate discharges the residue to a 1-cu. yd. car which is trammed and unloaded on the dump.

Quicksilver-laden gases from the kiln pass through a flue-shaped dust chamber to a 14-in. Sirocco dust collector. The dust-cleaned gases then pass through a pipe condenser, up a side hill flue to the stack. The dust contains only a negligible quantity of quicksilver and is wasted.

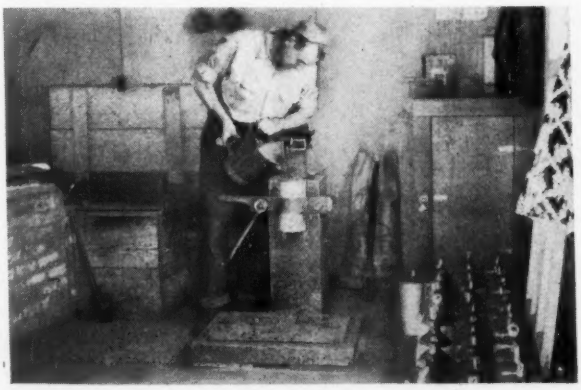
Draft for the kiln is provided, and the gases are moved through the condenser system by two fans. The first is a No. 35 ABC straight blade exhauster between the dust collector and condenser. The second is a No. 30 ABC rubber-lined exhauster placed at the end of the condenser system. With this two fan arrangement an adequate suction, needed for safety and to guard against loss, is maintained even with variations in the rate put through and without overloading the individual fan.

The condenser system was specifically designed for the treatment of low grade ore. It consists of a series of four parallel rows of vertical pipes, some 12 ft. high. Each row has 26 pipes, the first 6 being iron, the next 6 are made of 20 gauge 18-8 molybdenum steel and the remainder are salt glazed tile pipe. All pipes are 10 in. in diameter. The tile pipes are



Upper portion of the condenser system. Iron pipes at the right and 18-8 molybdenum steel pipes in the center and tile pipes at the end. All are 10 inches in diameter

Lower portion of the condenser system, showing how the pipes dip into a water filled concrete trough, where the washed product is caught in stoneware pans



Quicksilver collected from the daily clean-up is poured into iron flasks, each holding 76 lbs. of mercury. On the floor are seen different styles of flasks

connected on top by U's while the metal pipes have welded inclined H connections. Y's connect the bottoms of the alternate pipes on the bottom. These latter Y's stand in Y's of inclined cross pipes, the lower end of which dip into a water-filled concrete trough.

Cleanup Is Made Daily

A stoneware pan is placed under water in the trough beneath each inclined pipe. Each day the vertical and inclined pipes are washed down with a stream of water by inserting a hose nozzle through a hole in the cover. These holes are closed by cork stoppers. The washed product is caught in the stoneware pans which are lifted out, decanted of their water, and emptied on the soot table (an iron pan 3 x 5 ft. and 3 in. deep, set to slope to one corner). The floured quicksilver from the pans is sprinkled with lime and hoed. This causes the quicksilver globules to coalesce and the quicksilver runs to the low corner of the table and out through a gooseneck to the storage pot. Any soot left on the table is returned to the furnace. In the storage pot the quicksilver undergoes another cleaning process which is continued until the metal presents a perfect mirror surface. Then it is weighed on precision scales and bottled in iron flasks holding 76 lb. net of quicksilver. This daily clean-up gives a close check on the quality of the ore treated during the preceding 24 hours.

Flasks are tested for leaks in a bottle testing machine which applies compressed air to the flask while submerged under water. After testing, the flasks are cleaned by rolling them on a table with a charge of steel shot, blowing them out with compressed air and thoroughly drying them before filling.

Underground Exploration

The general plan of underground operation is to open the 800 level of mine through the Day Tunnel. This will be done mainly for drainage and ventilation, and it will also serve for a haulage tunnel.

Existing raises to the upper levels will be opened and equipped with chutes and gates and when completed mining can begin at a number of places. Ore can be removed for treatment or it can be stored in stopes and chutes for treatment during the winter months. A geologic study is being made to determine the best possibilities for locating new ore bodies. Exploration is planned as soon as mining operations in the old ore areas have been resumed.

Preparations are under way for underground mining through the Santa Rita shaft now being opened and retimbered to the 800 ft. level

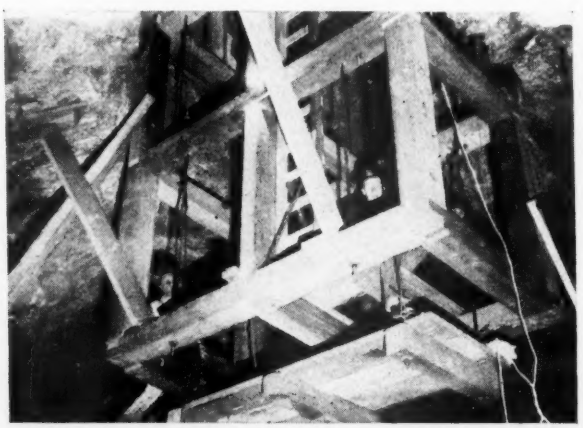
The Santa Rita shaft is being reopened to the 800 level to permit hoisting the ore to the surface from where it will be trucked a short distance to the plant.

The Day Tunnel has been opened for 1,300 ft. through badly caved ground and work should soon pass beyond this area opening the tunnel for its entire length of 3,600 ft. The two-compartment shaft had been retimbered to the 450 level early in March. A headframe 80 ft. high and a 175 ton ore bin has been erected over the shaft. A one ton bucket is used in the sinking process and a two ton skip will be used for hoisting. A 150 hp. hoist has been installed and an air compressor of 680 cu. ft. capacity will furnish air for the underground work.

A building was recently completed that has three divisions, a machine shop, a blacksmith shop and a truck repair and service shop. A lathe, drill press, power saw, hydraulic press, electric welding machine and overhead crane among the chief items of equipment. A steam cleaning plant, mounted on a truck, serves to clean the shovels, caterpillar treds and trucks before repairs. A pick-up truck and a runabout serve to haul small supplies and tools around the works.

This, briefly, is the outline of the latest chapter in the story of New Almaden from the start of operations under the New Almaden Corporation. A definite program has been followed thus far and the next step will be the resumption of underground mining.

Thus, once again this first and largest (in total output) quicksilver producer of the United States is active and helping in this our greatest war effort, just as it helped in 1917, 1898 and 1861.



Timbering in the two compartment Santa Rita shaft, at this point had reached a caved area at the 300 level

FSL...

a maintenance program for peak production

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Fewer repairs—Fewer repairs will result from regular inspections, adequate maintenance records and trained maintenance men. Westinghouse is ready to supply you with helpful literature for this purpose.

Shorter repairs—Where repairs are made in your own plant, an adequate stock of renewal parts will shorten repair time. Recondition worn equipment promptly.

Westinghouse field engineers can help you diagnose trouble in your plant.

Longer-lasting repairs—For repairs made outside your own plant, use reliable repair service. Westinghouse facilities and experience will give you guaranteed results.

For complete details of this plan, turn the page.

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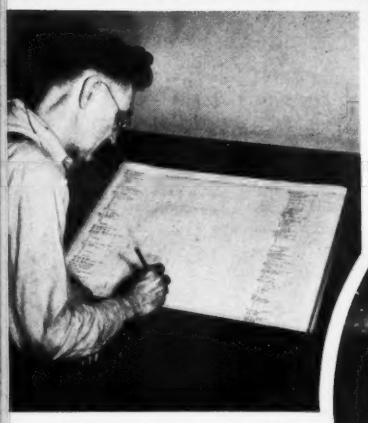
the FSL maintenance p

One of the most important steps to better maintenance is proper training of new maintenance men. Plan your training program immediately.



There are many ways of keeping maintenance records. The important thing is to adopt one and be sure it is followed.

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Fewer repairs

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Keep adequate maintenance records. A maintenance record of every piece of equipment is essential to war production.

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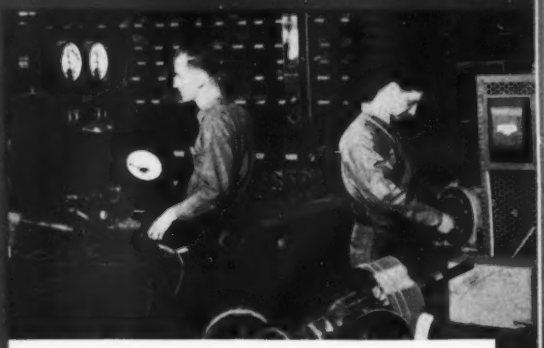

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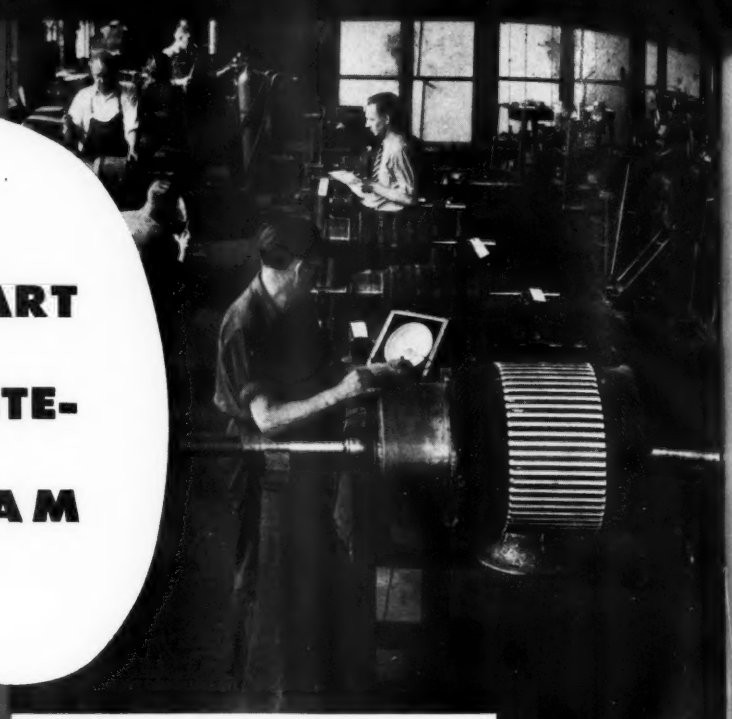

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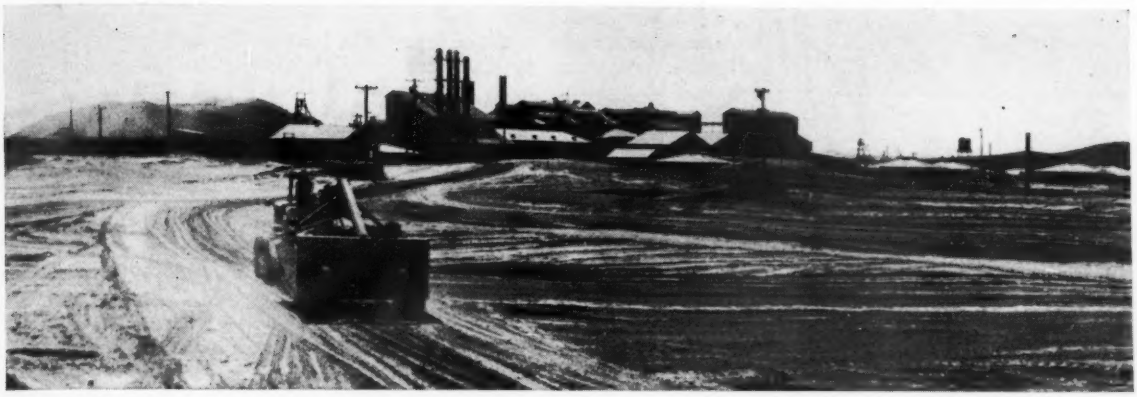


General view of the Pacific Coast Borax Company mine, near Kramer Junction, Calif. The carryall in the foreground is hauling material to one of the drill holes where it will be unloaded and dropped into a stope ready to be filled

STOPE FILLING in a Borax Mine

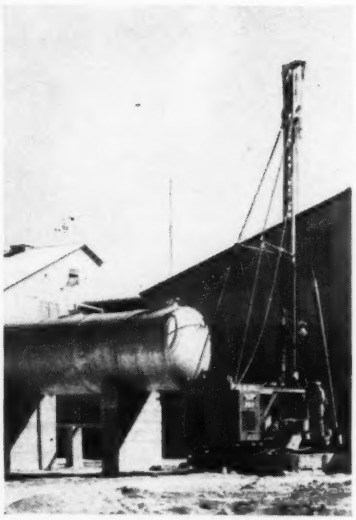
Holes are carefully located and drilled through 400 ft. of overburden to connect with the underground stopes. A novel slide that throws sand is used to fill the remote areas of the stopes.

By C. G. GRIM
Assistant Mine Superintendent
Pacific Coast Borax Co.

BORAX is mined by conventional shrinkage stopes methods. Stopes at the Baker Mine, near Boron, Calif., are made 20 ft. wide and 100 ft. long and have an average height of 100 ft. Some of the first stopes were 180 ft. long but during the past three years a distance of 100 ft. has been established. The ore is of a crystalline nature and no timber is required to support the back during operations. It is, of course, necessary to fill the completed stopes in order to prevent caving and to obtain maximum extraction. Since all development work is done in ore there is little mine waste available for fill material.

The original plan of stope filling involved the use of a 16-in. drill hole 400 ft. deep through which the material could be dropped to a storage bin in the mine and then distributed by cars to the various stopes. This method of stope filling proved to be too costly and revisions were made after a short period of operation. Since the major expense of the original plan was the hand labor required to distribute the material underground, it was found to be more economical to drill a hole for each stope and eliminate most of the underground handwork. The overburden, which averages about 400 ft. in thickness, is made up of cemented gravel and shale beds which allows rapid and inexpensive drilling and the upper 6 to 10 ft. is satisfactory for use in filling stopes. If the pillars and the back of the stope to be filled, are in good condition, the broken ore is completely drawn off. Any timbering and chutes in the haulage drift are then removed in a retreating manner so that work is carried on under timber protection. The track is also removed as the salvage work retreats. When the salvage work is completed bulkheads are constructed at all openings to the stope except the one to be used at the top of the stope for a retreat from final filling operations. These bulkheads are constructed with 8 x 8-in. posts and 3 x 12-in. lagging and where the opening is comparatively large, the 8 x 8-in. posts are set closer together and doubled up so that they will withstand the pressure exerted by the loose fill material.

The bulldozer has pushed overburden from a stockpile onto the grizzly, where a tender keeps the material flowing into the drill hole to the stope below



A Bucyrus-Erie 29T drill rig is sinking a hole that will connect with one of the stopes to be filled

When a stope shows signs of weight and indicates possible danger of pillar failure should the ore be drawn, the fill material is introduced before the ore is drawn and filling is continued as the ore lowers in the stope. About 10 percent loss of ore is experienced when this procedure is necessary and no timber may be removed. When all possible ore has been drawn the timbers are shot down and the filling operation completed.

Surface drilling equipment consists of one Bucyrus T-29 and one Armstrong 50 drills, both of which are standard preformed cable tool drill rigs. Both units are mounted on wheels and are self-propelled. All holes are drilled with an 8-in bit and then reamed to 10 in. unless the hole is fairly wet in which case it is reamed to 12 in. so as to reduce the danger of any cave-in. Casing is not generally necessary but occasionally a very wet hole is encountered that continually caves and plugs itself during the filling operation so that it is more economical to case the hole than to drill out the various cave-ins. Each drill rig will drill and ream a 400-ft hole in 40 to 48 hours drilling time.

Stopes 100 ft. in length may be filled completely from one hole drilled in the center of the stope but it has been found to be more economical to drill two holes in a stope 180 ft. long than to do the necessary distribution work that would be required if only one hole were drilled in the center. The locations of the holes in a stope 180 ft. long are 50 ft. each way from the center of the stope.

The surface material that is used for fill extends to a depth of 6 to 10 ft. and when the filling program first started it was possible to fill some of the stopes by pushing the material into the drill hole with a bulldozer. The surface material overlying the ore body was soon used up and it has been necessary to haul the material from off the ore body (which distance is ever increasing) by means of a LeTourneau carryall and either stock piling over the stope to be filled or dumping directly into a drill hole.

If the carryall is to dump directly into the drill hole a portable grizzly made of three 18-in. I beams with 30-lb. rails are placed over the hole. The rails are spaced and cross laced with 1-in. round rod so that the square opening is 6 in. on a side. The top of the hole is funneled out to a depth of about 5 ft. to allow for some space below the grizzly which is 6 ft. square. The carryall, which holds 7 cu. yds., brings in its load and the tractor stops the carryall in the dump position. The carryall dumps the load onto the grizzly and then moves on. It is necessary to keep a grizzly tender at the hole in order to keep the grizzly clear and see that the drill hole is kept open.

Slide Is of Simple Construction

If the material can be pushed by the bulldozer into the drill hole from a stock pile, a much lighter grizzly consisting of $\frac{5}{8}$ x 2-in bars with cross supports of $\frac{3}{4}$-in. round rod, making an opening 6 in. square, is used. The stock pile method is necessary at times since the carryall must be kept in operation as much as possible in order to move sufficient fill material, consequently the material must be stock piled during any delay in the underground fill operation.

When the underground preparatory work has been completed in a stope and the grizzly is in place over the drill hole, the filling operation is started. The material is pushed onto the grizzly or dumped on the grizzly, as the case may be, until the top of the accumulated pile in the stope is within 2 or 3 ft. of the back. Since the angle of repose of the fill material is about 50 deg. it is seen that about 65 percent of a stope 100 ft. long may be filled by gravity distribution from one drill hole located in the center of the stope.

The fill material must then be moved into the remaining 35 percent of the stope by other means than direct fall, and several methods have been tried. Hand shoveling proved to be too costly and both scraper hoist and belt conveyors were found inefficient, so a method was developed whereby the material could be deflected at the bottom of the hole and thrown horizontally by its own velocity in the desired direction.

The sand slide is of simple construction and is similar in appearance to those slides seen on a children's playground. The slide or trough is $\frac{1}{4}$-in. plate, 24 in. wide and about 6 ft. in overall length, with 10-in. sideboards made of $\frac{3}{16}$-in. plate. The slide is curved at the lower end and mounted on legs in such manner that when the base is level the upper portion of the slide is at an angle of 15 deg. from the vertical and the lower lip of the slide is horizontal. The legs are made of angles and bolted to the slide so that the whole apparatus may be taken apart and easily moved from one location to another.

After some use of this slide it was found that considerable hand work was still necessary. The material was thrown from the slide a maximum distance of 25 ft. horizontally which left a large void at the end of the stope that had to be filled by hand. Considerable material accumulated under the lip of the slide which had to be kept constantly removed by hand mucking. To eliminate this hand work a power driven wheel was installed on the lip of the slide which, assisted by the velocity of the falling material throws the material about 15 or 20 ft. above the horizontal and out to a distance of 50 ft. from the slide.

The wheel consists of a cylindrical

The top of this pile is about 30 ft. from the back of the stope. It must be brought up to within 2 or 3 ft. of the drill hole before the slide can be set up

piece of ¼-in. plate about 14 in. in diameter and the same length as the width of the lip of the slide, or 24 in. attached to an axle with ball bearings at each end. Blades have been welded to the cylinder so that they lean back slightly from direction of rotation and are parallel to the long axis of the cylinder. The blades are 5 in. high, extend the full length of the cylinder and are supported or stiffened at the center with a small knee brace.

The wheel is mounted on a frame that is pivoted directly under the lip of the slide. A 15 h.p. electric motor is mounted on the back end of the frame underneath the slide and connected to the wheel with a "V" belt drive. The wheel is located directly in front of the lip of the slide but high enough so that the flow of sand may strike the top of the blades. The frame is pivoted so that the wheel may be raised or lowered which in turn controls the height of throw of the material. The speed at which the wheel should rotate is an important factor in its operation and this must be determined by experiment.

When a stope 100 ft. long has been filled as much as gravity will allow, the top of the pile is levelled and a platform 6 ft. square is made of 2 x 12-in. plank directly beneath the hole. The slide is then brought into the stope and placed on top of the platform in such a position that the fall of material from the hole will strike the slide near the top of the trough. The base of the slide is then pivoted to the platform by means of one bolt so that the slide may be turned in a horizontal arc about the center of the drill hole. The slide is then pointed in the direction in which it is desired to throw the material and the motor that drives the wheel is started before allowing any material to fall on the slide. It is important the wheel is revolving before dropping material in the hole as the obstruction offered by the idle blades of the wheels would cause the slide to be buried under the material.

When everything is in readiness the underground crew, consisting of an operator and helper, talks to the surface crew by means of a portable telephone which is always kept handy and the filling operation started. As the material strikes the slide it is thrown out to the end of the stope until the portion of the stope below the horizontal is completely filled. The wheel is then raised so that a greater portion of the blades contact the flow of material which throws the material above the horizontal thus filling the stope completely to the back. The slide may be turned on its pivot during the operation so that both ribs of the stone in that end may be completely covered.

Holes Are Sealed with Cement and Lake Mud

When the dead end of the stope is filled the surface operation is discontinued and the slide is pivoted through 180 deg. and the filling operation is started on the retreat end of the stope. This end of the stope is then filled to the back along the ribs but it is of course necessary to leave a small passageway along the center line of the stope from the drill hole to the stope exit. When the filling operation is completed the slide is taken apart and moved out to the next operation.

Considerable effort is expended in order to keep the dust to a minimum throughout the filling operation. The entire area from which the carryall digs its load is wet down thoroughly with water sprays, the roads on which the carryall travels to and from the drill holes are also sprinkled at various times during the shift, and the stock piles are sprinkled before the bulldozer pushes the material into the hole. It is necessary, however, that the fill material is not made muddy or sticky by too much water as it then tends to build up on the slide and wheel causing considerable trouble and delay. Even though the dust is kept at a minimum during the entire operation all men, both on top, and in the mine, are required to wear respirators.

All holes drilled into the stopes are sealed off after the filling operation has been completed in order to be sure that water is kept out of the ore body. When the fill material has been completely distributed in the stope the holes are allowed to fill from the bottom to at least 40 or 50 ft. above the top of the ore which is at least 20 ft. below the water bearing strata. Cement is then poured in the hole so that a good plug is formed. Lake mud, an excellent water seal, is then added to within 100 ft. of the collar of the hole. Among 60 holes drilled into the Baker deposit for stope filling purposes, not one has developed a leak after being sealed.

The final job in the stope filling operation is furnishing the support for the roof of the stope when the fill is not up to the back. This is done with the use of timber cribs constructed on top of the fill and wedged tightly to the roof. The cribs are spaced about 20 ft. apart in the long direction of the stope. A crib is made up of 8 x 8-in. salvaged timbers of various lengths placed in layers on a plank foundation, each layer at right angles to the one below it. As a rule the cribs are 6 x 10 ft. and 4 or 5 ft. high, although this depends upon the amount of fill that has been introduced to the stope.

This method of filling stopes has proved to be very economical for this particular mine, although it is seen that for other mines the method might be too expensive where the overburden is too thick or too hard to drill easily. The fact that most of the stopes are in such condition that all the ore may be drawn before starting the fill is also of importance to the economy of the system.

Note light flow of material from the drill hole striking slide at left and being thrown out and up to the right by the power wheel

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With the **COAL DIVISION**

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MAINTENANCE AND INSPECTION OF MINE HAULAGE ROADS

MAINTENANCE of equipment has become one of the most important factors in coal mining and the industry is giving a great deal of time and thought to methods and practices for conserving supplies and keeping machines in running order. Underground transportation is the key to production and in addition to maintaining the mobile equipment such as, cutters, drills, loaders, and locomotives, it is equally important that the haulage system should not be neglected.

The Haulage Road Committee several years ago conducted an extensive investigation on mine track construction and published a report, that gave in considerable detail the essentials of a track maintenance program. At a recent meeting of the committee it was recommended that the following extract of this report be republished in the MINING CONGRESS JOURNAL for the purpose of calling to the attention of the industry the necessity of keeping the underground haulage system in proper condition to handle the large tonnage.

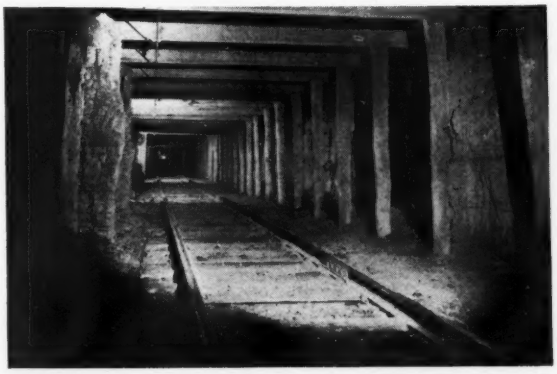
● ***An Extract of a Previous Report Which is Being Reprinted by Special Request of the Haulage Roads Committee.***

Construction Features

To begin with, a mine haulage road must be properly installed and the materials used in the construction must be selected with due reference to the life of the track and the service required. Specifications are available, based on experience, for the correct sizes of ties, rails, turnouts, etc., and in general the proper selection of these materials is usually found in a modern operation.

A most important factor in the construction, is the track alignment. Mine entries are supposed to be driven on survey points and the tracks should follow these points; laxity in this respect indicates improper supervision which should not be excused. The economy of a straight haulageway should be obvious; curves retard the speed of the trips, cause side-sway of the cars with resultant coal spillage, to say nothing of the increased wear and tear on wheels, trucks, and the track itself. Rolls and dips in the coal seam cannot be eliminated but abrupt changes in the grade are detrimental and should be reduced by cutting or filling.

After a haulway has been installed then the story has just begun, even though, best practice has been followed in the selection of the materials, the track alignment and the road bed grading. Continual inspection and maintenance are required to keep the track in its original condition and unless this is done, all of the thought and care that has been used in the installation will have been wasted. Both in construction and maintenance we can profit greatly by the experience of



Properly constructed mine haulage roads compare favorably with railroad practices

railroads. The excellent alignment of main line tracks on tangents and curves, the upkeep of the drainage, and the general neatness of the entire right-of-way are familiar to all of us but we should keep in mind that railroad practices are based on utility and economy and not for the sake of an attractive appearance.

Installation and Maintenance

Track maintenance work is divided into the following five major classifications, ballast, drainage, ties, rails and joints, and turnouts. The neglect of any one item will cause a weak link in the chain of an economical underground haulage operation.

Ballast

Ballast has several functions to perform; it holds the ties in place; it compensates for inequalities in the mine floor; it transfers the load over the entire tie; and produces an elastic road bed. Whatever type of material is used originally, continual maintenance is required, as ballast will deteriorate and under constant use will be forced out from under the ties. Tamping is important, as loose ballasts will permit track undulations, which will move the rails out of alignment and will also cause unequal loading. If ballast is tight at the center of the tie, either through improper tamping or through action of the rolling stock, "center pack" results and tie breakage occurs.

Drainage

Irrespective of the type or amount of ballast, weight of rail or size of tie, good track cannot be maintained on a soft road bed and adequate drainage is a primary essential. Wherever possible the main ditches should be located in a parallel entry rather than along the haulageway but in any case, the bottom of the ballast must be kept above water level. When water enters the ballast, "Tie pumping" occurs under the pressure of the moving trip; this will wash the ballast from beneath and around the ties, resulting in a low spot in the track. One low spot will cause surface bends in the rails and will also tend to cause loose joints.

Proper track installation is possible under difficult seam conditions

Ties

Tie failures cause operating delays and the removal and replacement of wornout ties adds an appreciable item to the track maintenance cost. When the expected life of a main haulage road is longer than the average life of an untreated tie it is economical to use some form of wood preservative and pressure treatment is recommended. Standard specifications are available for sizes and spacing of ties for various weight of rail and in general it is good economy from a maintenance viewpoint to follow these standards.

Rails

The size of rail used in main lines is to some degree determined by local conditions such as weight of the rolling stock, speed of the haulage trips, and grades encountered, but here again, after the installation, maintenance is the controlling factor and heavy weight track material will not compensate for lack of maintenance.

Gage rods are sometimes used or, as a substitute, steel ties are placed at 6- to 10-ft. intervals between wood ties, but adequate spiking, good quality wood ties, and a well ballasted road bed will usually serve to keep the average main line haulway in proper gage. Other track accessories such as, tie plates, rail braces, and guard rails may be effective under certain conditions but these do not in any way obviate the need for constant maintenance and inspection.

Rail Joints

The greatest wear occurs at the joints and railroads estimate that 70 percent of their total track maintenance cost is spent at the track joints. Angle or splice bars must be of correct size with proper bolt hole spacing to insure a tight fit. Loose bolts can be prevented to some degree by lock washers but these are not 100 percent successful and whether or not lock washers are used, the bolts should be tightened soon after their installation and frequently inspected and retightened thereafter. A low or loose joint may cause misalignment as the lurch of the trip and consequent excessive pressure of the wheel flanges against the rail head at the low spot tends to throw the track out of line.

Badly worn rail ends and wide spaces between the rails cause wheel hammering which is not only hard on the rolling stock but further tends to aggravate the bad joint condition. When the track is installed, the rails should be butted tight together and if the ends are worn, repairs should be made by welding.

Turnouts

Standards for all parts of mine track turnouts have been designed to give the greatest service, and well designed material of proper quality will eliminate replacements. However, wear will always occur, particularly on the switch and frog points and constant inspection is necessary. One of the most important items of switch maintenance is to keep the track clean of coal, rock, and other material.

Track Inspection

Track inspection consists of the observation and notation of defects which cause track failures and maintenance must include the prompt and proper correction of these defects. The most common causes of track failure, together with manner of correction, are outlined in the following paragraphs.

Road Bed and Drainage

Low joints. Caused by loose track bolts, worn angle bars, loose ballast, inadequate drainage, or wheel hammer due to different degrees of wear on rail heads. Remedy: Replace defective material, drain if necessary, raise joint and retamp ballast.

Low rails. Caused by loose ballast, grade subsidence, or inadequate drainage. Remedy: Drain if necessary, raise track, and install additional ballast.

Loose ballast. Caused by improper tamping. Remedy: Replace ballast and tamp thoroughly.

Tie pumping. Caused by inadequate drainage. Remedy: Make permanent provisions for removal of water, raise track and tamp additional ballast.

Grade subsidence. Caused by soft bottom and inadequate drainage. Remedy: Provide all possible drainage but if complete removal of water cannot be effected, install a timber grill on top of subgrades and use ballast on top of grill.

Heaving bottom. Caused by action of air moisture on some types of bot-

Properly maintained track from the face to the shaft bottom increases production in these times of rush for maximum output

tom, or by weight of overburden transmitted through pillars to soft pavements. Remedy: Lower the subgrade 6 to 12 in., dependent upon degree of heaving, and fill in with ballast material. Line and resurface properly, leaving the track 2 to 3 in. below grade.

Center-pack. Caused by improper tamping under center of ties or by using too short ties or by loosening of ballast under rails and tie ends. Remedy: Loosen ballast under center of track and tamp firmly under rails and at ends of ties. If necessary, install longer ties.

Wet road bed. Causes outlined under the above factors contributing to bad track clearly show that probably the most important cause of track failures is water or wet road beds. Drainage must be cared for continuously.

Clearance. Good clearance can be destroyed by track swing, improper setting of posts, or improper placing of material along the sides of the haulage way. Lack of clearance should be corrected at once to prevent accidents or derailments.

Cleanliness. Haulage ways should be kept clean and not used as material storage places. Ballast should not be allowed to accumulate on top of the ties.

Ties

Decay is caused by low forms of plant life called fungi. Ties showing fungus growth should be checked for decay and replaced when found unserviceable. Where track life warrants, install treated ties.

Splitting usually occurs between the spike and end of the tie. If splitting is of such extent that the spike cannot be redriven where it will hold effectively, replace the tie.

Rail cutting usually occurs in the softer woods. It is caused by soft bottom, loose spikes, and rail tilting under passing trips permitting the edge of the rail base to work into the tie. Remedy: Drain bottom where necessary. When not excessive, tie may be turned over and respiked on uncut surface. When excessive, replace the tie. Rail cutting may be the result of a combination of adverse factors which can only be eliminated by the installation of tie plates of proper design.

Rail

Improper gage. Misalignment and bad surface are the foremost causes of improper gage. Loose fastenings or excessive wear are also causes. Correct the alignment and surface, respiking or removing worn rails where necessary. Gage rods are effective in maintaining gage for heavy service on sharp turns.

Loose spikes. Caused by rotting ties, misalignment, use of undersized spikes, by shock of derailments, improper spiking, etc. Remedy: If tie is sound, reline track where necessary, remove and redrive spikes, being careful to plug old spike holes.

Broken rails. Caused by derailments, gapping rail ends, use of old and crystallized rail, or by too large tie spacings. Remedy: Close gaping rail ends, use good rail, check tie spacing and tamping. Use full size, full bolted angle bars or weld the joints.

Rail creeping. Factors tending to promote creeping are loose spikes and bolts, long spaces between ties, yielding subgrade and lack of drainage. Remedy: Elimination of above causes.

Turnouts

Inspection should include a thorough examination of all turnouts, particular attention being given to the following:

Head rod throw. Check distance for correctness.

Heel spread. Check distance for correctness.

Switch rod clips. See that they are not cracked and that bolts or rivets are tight.

Switch point heel fastenings. Examine spiking and see that connection to closure rails is satisfactory.

Closure rail fastenings. See that closure rails are securely spiked, particular attention being given to the switch heel end of the curved rail.

Frog fastenings, spikes, and bolts. Examine for security.

Switch points and frog points. Check gage lines to determine presence of undue wear.

Guard rail fastenings. See that these are tight, and that proper stock rail clearance exists.

Switch throw adjustment, particularly where spring connecting rods are used. The switch throw must exert equal pressure on switch points when they are closed against either stock rail.

Lubrication. Switch slide plates and switch stands should be kept well oiled.

Cleanliness. Switches and frogs should be kept clean and free from coal, ballast and other material to a depth of 2 to 3 in. below the top of the ties.

General

Track deterioration occurs chiefly under use but deterioration also occurs even while the track is not in use. Continual inspecton is needed and it is recommended that the maintenance work should, as far as possible be done on idle days when the repair crew would be free from interruptions.

A fair average installation cost of a mile of main line mine track is about $10,000; this investment justifies a reasonable cost for maintenance.

WHEELS of Government

● *As Viewed by A. W. Dickinson of the American Mining Congress*

Washington Highlights

ANTI-INFLATION—"Fireside chat" virtually freezes everything but wages and farm prices.

TAX BILL—94 percent excess profits tax rate decided upon.

PERCENTAGE DEPLETION—Treasury again attacks existing provision.

LABOR CONTROL—Smith-Vinson 48-hour workweek bill in a blackout.

MANPOWER BOARD—McNutt directs policies governing use of labor throughout war program.

PRICE CEILINGS—A reality after May 11 and July 1. Ores and concentrates among exempted items.

ASSESSMENT WORK—Congress grants suspension for two years.

SILVER—Joins the ranks of war metals and goes to work.

MINING PRIORITIES—Critical materials allocated for mine equipment manufacturers.

DEEP-SEATED conviction of the magnitude and seriousness of the task which lies ahead rises above all else in the present war situation. Returning from its recess during the first half of April, the Congress resumed for a few days its discussion of labor control legislation, but policies emanating from administration sources and recently given nation-wide pronouncement in the President's "fire-side chat" put an effective quietus on any legislative action, at least for the time being. Broadly stated, the anti-inflation program called for heavy taxes, rationing of scarce articles, price and credit control, wage stabilization, and a widespread war bond sales campaign. From the War Labor Board also has come the administration-inspired statement that while wages will not be frozen the industrial wage situation will not be permitted to get out of control.

Work on Tax Bill

Hearings on the coming Revenue Bill of 1942 were brought to a close by the House Committee on Ways and Means after running since the third of March, and are being followed by extended executive sessions. In the order of consideration, corporate income and excess profits taxes have come first, and will be followed by determinations on individual income taxes, estate and gift taxes, selective excise taxes, and a number of other tax proposals including various forms of sales taxes.

Thus far, it has been decided to use a flat excess profits tax rate of 94 percent, applicable to earnings in excess of the small exemption plus the credit based either on invested capital or average earnings. After the levy of 94 percent on excess earnings the remaining 6 percent would not be subject to normal tax or surtax. The invested capital credit range has been changed to 8 percent on the first $5 million, 7 percent on the next $5 million, 6 percent on the next $190 million, and 5 percent on all capital over $200 million. Corporation normal tax remains at 24 percent and the surtax rate is increased from 7 to 16 percent, making a total rate of 40 percent on normal income compared with 55 percent requested by Treasury officials.

The Treasury staged a surprise attack on the percentage depletion deductions for oil, gas and mines on the day before the close of the hearings, when Randolph Paul endeavored to present rebuttal testimony to the effect that the deduction does not stimulate exploration and discovery, and that its elimination will not endanger the supply of raw materials needed for the war effort. One suggestion made by Mr. Paul would permit percentage depletion in the case of stripper wells and marginal mines as well as in the case of new discoveries. The greater part of Mr. Paul's statement related to oil and gas and was not pointedly directed at mines.

Chairman Henry B. Fernald of the American Mining Congress Tax Committee had been scheduled to appear before the Committee on Ways and Means on April 16 and so quite by coincidence followed Mr. Paul on that day. Mr. Fernald replied effectively to Mr. Paul's second attack on depletion and stated to the members of the Ways and Means Committee that the seven American Mining Congress witnesses who appeared on March 24, had covered the subject adequately and that their testimony had in no wise been refuted.

Mr. Fernald addressed himself particularly to the need for a unit of production credit for excess profit tax and discussed the amendment submitted in September, 1941, by Senator Edward C. Johnson of Colorado. That the Treasury recognizes the difficulties encountered by mining operators under the excess profits tax law is indicated by the following statement made by Mr. Randolph Paul:

> "Representatives of the mining industry have pointed out that the acceleration of production for war purposes will subject the industry to greatly increased income and excess profits taxes at the time when it is exhausting reserves that might be produced in later years under lower tax rates. The Treasury is aware that producers of exhaustible mineral resources face a special

problem in increasing production by using available reserves, and is studying methods of providing appropriate relief under the excess profits tax. This problem, which involves both price policy and tax policy, affects all producers in the industry and not only the relatively few who now benefit from percentage depletion. Any solution of this problem should be applicable to the large number of producers who now get no benefit from percentage depletion as well as to those who do."

Mr. Fernald also endorsed the Treasury's expressed willingness to remove the present capital stock tax and its companion the declared-value excess profits tax. He also stated that the mining industry is in full agreement with the Treasury's recommendation that consolidated returns, out of the law since 1934, be restored.

At the close of the hearings Representative Wesley Disney of Oklahoma, a member of the Committee on Ways and Means, presented for the record an amendment which would provide a new election for percentage depletion for those mineral producers who failed to elect in 1934 or in the "first return" thereafter as interpreted by the Bureau of Internal Revenue.

Labor Control Deferred?

Strong pressure from administration sources accounted for by the needs of war production have dulled the demand for labor legislation in the Senate and House. Late in April Senator Connally withdrew his motion which would have brought his anti-strike bill before the Senate. Over in the House a vote of 13 to 12 in the Committee on Naval Affairs tabled the Smith-Vinson bill which would have provided a 48-hour workweek without payment of overtime and the freezing of the closed shop status in industry for the duration of the war. Any renewal of consideration of this type of legislation will now apparently come only through further demands which may be brought about by stoppages in production due to labor difficulties.

Now a Manpower Board

The President has appointed Paul V. McNutt as the chairman of this powerful agency which will direct policies governing the use of labor, control the training of workers and the application of labor priorities, and besides concerning itself with questions of industrial deferment from military service will rule on curtailment of production in non-essential industries, housing problems, determination of vacations, staggering of shifts, and relocation of workers and their families.

Assisting Chairman McNutt in the Board's work to provide for the effective mobilization and maximum use of the nation's man and woman power for the successful prosecution of the war will be, for the War Department G. H. Dorr; for the Navy, Undersecretary James V. Forrestal; for Agriculture, Secretary Claude Wickard; for Labor, Secretary Perkins; War Production Board, Donald M. Nelson Labor Production Division of WPB, Wendell Lund; Selective Service Commission, Major General Lewis B. Hershey; and Civil Service Commission, Arthur S. Flemming.

Price Ceilings a Reality

Under effective dates ranging from May 11 to July 1, a price ceiling order was issued by the Office of Price Administration late in April. Exemptions from the price-freezing order have been made, however, in the case of domestic ores and concentrates, and zinc, lead and tin industrial residues. Generally speaking the basis or price level dates for the ceilings which affect coal and metals range from October, 1941 to the end of the year. Ceiling prices are not a new thing to metals producers but are of course an extremely serious matter as an innovation to the producers of coal, with its multitude of grades and sizes and with the highly competitive condition which exists between the many producing fields of the country.

Mining Claim Assessment Work

For a number of years there has been an annual controversy over the suspending of the law requiring assessment work to be done each year on mining claims which are being held for patent. The Department of Interior has consistently reported to the Mines and Mining Committees of the House and Senate against the granting of this suspension and it is understood that a similar report was made again this year. Late in April, however, a bill by Representative O'Connor of Montana was passed by both Houses and is now at the White House awaiting the President's signature. The bill this year provides that the assessment work need not be done for the period beginning July 1, 1941 and ending July 1, 1943.

Silver at Work

Action initiated by the War Production Board has resulted in the Treasury making arrangements to loan

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From this old, yet imposing building the State Department carries on its important work, that reaches to every part of the world

The registration desk is crowded with mine operators and manufacturers

Coal Convention Contributes Force To the Industry's War Effort

● Government, coal industry and equipment manufacturers effectively welded together in two-day meeting. Abstracts of all the papers presented at the meeting will appear in the June issue.

"AN impressive contribution toward speeding the war effort in the coal industry." This remark summarizes the views of all who attended the 19th Annual Coal Convention of the American Mining Congress in Cincinnati, April 27-28. Operators, manufacturers and government officials gathered at the Netherland Plaza Hotel and exchanged ideas and information typical of a fast-moving war-minded American industrial council. Among the subjects discussed were operating problems of both deep and strip mines, maintenance of equipment, mine safety, personal problems, salvage and conservation, priorities on mining equipment, espionage and sabotage prevention, and the government's coal storage program.

Of particular importance was the meeting on priorities headed by Dr. Wilbur Nelson and Lane W. Hildreth, WPB Mining Branch, for manufacturers serving the coal industry. Here Dr. Nelson virtually conducted an "Information Please" session with more than 100 men from many parts of the nation who fired questions which removed doubts and clarified interpretations regarding priorities orders.

The sessions devoted to the discussion of coal mining included mechanical loading and conveying, power distribution, strip mining, haulage and coal preparation. Attendance was large at these meetings and it was felt they contributed much to the industry.

Wartime Problems of a Vital Industry

The convention was opened by Julian D. Conover, secretary, American Mining Congress, who struck the keynote for the purpose of the meeting. "We in the coal industry have pledged our complete cooperation to our government and we are meeting to see how we can best carry out that pledge and serve our country."

The entire morning of the first day was devoted to talks by leaders of the industry. J. Noble Snider, vice president, Consolidation Coal Company, presided, and stressed the importance of efforts to maintain efficiency and maximum production in a threatened shortage of experienced manpower for mechanized coal mining.

Harry M. Moses, president, H. C. Frick Coke Company, and chairman of the Coal Division, American Min-

ing Congress, called upon the industry, and every citizen and organization to devote all its energies and concentrate their all out effort so that the war would not be won ultimately but in the very near future.

E. J. Burnell, vice president, Link-Belt Company, chairman, Manufacturers Division, American Mining Congress, said the coal mines in the nation would provide the gigantic surge of driving power through which Americans, all over the world, will put a withering heat on all enemies of Democracy.

One of the wartime problems, that of keeping a steady supply of men operating in the mines was discussed by W. B. Geise, Susquehanna Colleries Co., Nanticoke, Pa.

"Prevention of Espionage and Sabotage," was discussed by Quinn Tamm, chief, Identification Division, Federal Bureau of Investigation. Mr. Tamm, a former mining engineer and geologist, revealed in an interesting discourse how the FBI "gets its man." He stressed the importance of fingerprinting and pointed out the advantages of this application in the coal mining industry.

At the luncheon meeting in the Hall of Mirrors, Netherland Plaza Hotel, Charles Dorrance, president, West Virginia Coal & Coke Corp., Cincinnati, presided. He introduced T. J. Thomas, associate director of bituminous coal, Office of Solid Fuels Coordination, who told the gathering that the output for coal mines must be carefully coordinated with available transportation facilities. Mr. Thomas left no doubt in the minds of his listeners about the importance of coal. He said, "Coal is an essential commodity. It provides 52.2 percent of the nation's energy. Indeed, it is of such great value toward winning the war, that without an adequate supply of fuel we would face a very serious dilemma. Furthermore, because of the shortages of other fuels, it appears that any substantial increase in the nation's energy must be supplied by coal."

James D. Francis, president, Island Creek Coal Co., and vice president of the American Mining Congress, pledged the industry's complete effort in winning the war. He also said that coal could be called a critical mineral, and its importance in the war program should be more effectively brought to the attention of the miners themselves.

Engineers and manufacturers interested in loading and conveying problems met following the luncheon and heard three papers. H. C. Rose, production manager, Pittsburgh Coal Co., was unable to attend and serve as chairman of the meeting. C. W. Connor substituted and he introduced I. N. Bayless, who read the paper scheduled to be presented by Paul R. Wickliffe, president, W. A. Wickliffe Coal Co., Greenville, Ky. Subject discussed was Duckbill Mechanical Loading, and it highlighted the contributions made by the company in improved designs for shaking conveyors and duckbill loading units to meet the requirements of greater efficiency in coal production.

Gathering Belts and Multiple Conveyor Units was the title of a paper by E. H. Jenks, chief engineer, Rochester & Pittsburgh Coal Co., Indiana, Pa. He discussed the advantages of multiple conveyor belts for low coal and he ventured the prediction that a cutting and loading machine loading onto conveyor belts will be the modern answer for exploiting low coal.

Maintenance and Conservation of Equipment is a subject of special interest to every operator. Edgar Schweitzer, Lehigh Valley Coal Co., Wilkes-Barre, Pa., described various methods used to conserve equipment in the anthracite industry. Electric and acetylene welding methods are the most widely adopted practices that contribute longer life to mining machinery. He also described some uses in the coal industry of metallizing or metal spraying.

Advances in Strip Mining Practice

Primary and Tandem Dragline Operations. This much discussed subject was also the title of a paper presented by Lafe Stewart, chief engineer, Maumee Collieries Co., Terre Haute, Ind. He pointed out the advantages of employing a large dragline at the company's particular strip pit operation as against power shovels. Feature of his address was a colored movie film showing the company's operation.

Power Distribution and Protective Devices, Russell C. Alpine, chief electrician, The Enos Coal Mining Co., Oakland City, Ind., discussed in a comprehensive manner the factors determining whether a substation serving electrical stripping equipment should be of wood, or steel, and he pointed out the likelihood any new structures whether for long or short life, would probably be constructed of treated timber.

Drift Mining from Strip Pits. This interesting paper by J. M. McCoy, engineer, Truax-Traer Coal Co., St. David, Ill., very properly posed the question in describing his problem "to drift or not to drift." He explained how the carefully planned work by his company involved 20 sets of layouts before they proceeded to mine coal from a strip pit where overburden was too deep to continue stripping. He pointed out the many conditions the operator must consider in drift mining, the most important being is

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Admiral Thomas C. Hart, United States Navy, with E. J. Burnell, vice president, Link-Belt Co., on his right, and Harry M. Moses, president, H. C. Frick Coke Co., briefly discuss current events before the banquet

PERSONALS

Paul Maxey has been appointed chief engineer of the Nellis mine of the American Rolling Mill Company, Nellis, W. Va., and **A. E. Oakley** is now general mine foreman, filling the position formerly occupied by Mr. Maxey at the Nellis.

J. C. Baragwanath, vice president of Nicaro Nickel Co., has been placed in charge of the company's operations in Cuba. This company is a subsidiary of the Freeport Sulphur Co. Mine development and plans for a reduction works are under way. Mr. Baragwanath is making his present headquarters in Havana.

Thomas H. Queer has been elected chairman of the Bituminous Coal Producers Board, to succeed the late J. O. Smith, who died earlier in the year at his home in Mt. Lebanon, Pa. Mr. Queer had been vice chairman of the Board.

Earl K. Nixon has been appointed technical advisor to the War Production Board in the Northwest. Mr. Nixon is director of the Oregon State Department of Geology and Mineral Industries, 702 Woodlark Building, Portland, Oregon.

N. P. Rhinehart, chief of the West Virginia State Bureau of Mines, announces the appointment of **James D. Alexander,** of Eskdale, as district mine inspector for Kanawha County.

Dr. Walter Dill Scott, president emeritus of Northwestern University, and **Louis J. Brann,** a former Governor of Maine, have been appointed as representatives of the public on the Industry Committee on Solid Fuels.

H. D. Schminky, recently accepted the position as assistant superintendent with the Loyalhanna Coal and Coke Co., Cairnbrook, Pa.

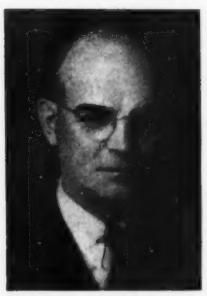
Paul D. Bliss, formerly employed by Lake Shore Mines, Ltd., in Ontario, is now an industrial planning representative for the U. S. Air Corps in Minneapolis, Minn.

Dr. A. J. Lanza, assistant medical director, Metropolitan Life Insurance Company, and chairman of the Industrial Hygiene Foundation's Medical Committee, has been assigned the duty of organizing a division of industrial hygiene in the U. S. Army. Dr. Lanza will enter the Army with the rank of lieutenant colonel. He will continue to serve actively as chairman of the Medical Committee. Dr. Lanza is well known in the mining industry for his studies and research on silicosis and industrial dust hazards.

W. P. Vance, general superintendent, Butler Consolidated Coal Co., was recently made president of the Thick Vein Freeport Operators Association, Pa.

Howard I. Young, President, American Zinc, Lead & Smelting Company, St. Louis Mo., announces the appointment of **M. K. Easley** as sales engineer for the American Zinc Sales Co. in St. Louis. Mr. Easley has been with the company since February, 1921, and has been connected with the pigment sales and operating staff at Columbus, Ohio. **William T. Maidens,** since 1937 superintendent of the Columbus, Ohio, plant, American Zinc Oxide Company, has been promoted to the position of general superintendent of the Columbus operations of the company. He joined the company in 1920.

Reno H. Sales, chief geologist, Anaconda Copper Mining Co., Butte, Mont., was awarded the 1942 Egleston Medal of the Columbia University Engineering Schools Alumnae Association, on April 23, at the Columbia University Club, New York City. Mr. Sales has been chief geologist for Anaconda since 1906. In making the announcement Dean Joseph W. Barker said: "Mr. Sales has attained high distinction in his career as a mining geologist not only for his brilliant and comprehensive scientific work in the Butte district but also for the convincing way in which he has demonstrated the value of geology to the entire mining industry. His detailed mapping and careful interpretation of the intricate faulting and complex mineralization at Butte made it possible to apply geology to mining problems with a precision heretofore unknown."



Dr. William B. Fulton, senior surgeon in the United States Public Health Service Reserve, and a former director of the Bureau of Industrial Hygiene of the Pennsylvania Department of Health, has been appointed chief of the Health Division in the Bureau of Mines, Department of the Interior, according to an announcement made recently by Dr. R. R. Sayers, director of the Bureau. Dr. Fulton will direct the Bureau of Mines' expanding activities in safeguarding the physical welfare of thousands of workers in the mineral industries—an increasingly important task since the accelerated wartime production of many metals, fuels, and other minerals has introduced new health hazards and emphasized old ones, according to Dr. Sayers.

William Harris, 2667 Beverly Street, Highland Park, Salt Lake City, Utah, has been appointed sales representative and service engineer for the Sinta-Set products of the Carboloy Company, according to a recent announcement by **W. C. Weslow,** manager of the Mining Division, Carboloy Company, Inc., Detroit.

Bureau of Mines Director Sayers has announced the appointment of **Robert H. Ridgway** as chief of the Coal Economics Division of the Bureau, succeeding F. M. Shore, who has been promoted to assistant chief of the Bureau's Economics and Statistics Branch.

Robert H. Ridgway

For the past year and a half Mr. Ridgway has been on loan to the War Production Board. In his new position, Mr. Ridgway will direct technical and economic investigations, the compilation of developments in the solid fuel industries, and special investigations.

Philip R. Grossman has been appointed manager of the Philadelphia office of the Consolidation Coal Co. Mr. Grossman's headquarters are located in the Broad Street Station Building.

Daniel M. Rugg, vice president of Koppers Company and general manager of the Brooklyn division, has been elected a vice president of Koppers United Company, it was announced recently by **J. T. Tierney,** president.

George E. Stringfellow, one of the primary executives of Thomas A. Edison, Inc., West Orange, Essex County, N. J., recently was the recipient of a citation. The Essex County Conference of Catholics, Jews and Protestants and other organizations honored him for his sincere devotion to many undertakings in the field of good will and recognized him as an arbiter and ambassador between industrial leaders and the rank and file of labor.

On April 15, Franklin Institute awarded the Franklin Medal to **Dr. Jerome C. Hunsaker**, general coordinator of Navy Research and chairman of the National Advisory Committee for Aeronautics, and to **Dr. Paul Dyer Merica**, vice president of the International Nickel Co., who achieved recognition for his work in the hardening of alloys. Dr. Merica announced in 1917 a new and revolutionary theory concerning the treatment of aluminum alloys. This was the forerunner of many years of work with these materials, as well as with alloys of nickel and alloy cast iron.

Walter E. Scott, Jr., consulting mining engineer, Central City, Colo., has accepted the position as production engineer for the E. F. G. Engineering Works, Inc., in Pueblo, Colo. The company supplies equipment for many mines in Colorado.

Ralph Keeler, formerly mining editor of the *Manila Bulletin*, was reported wounded in a Japanese attack by a sniper's bullet, aimed at Brig. Gen. James Weaver, American tank commander. Mr. Keeler held a commission of first lieutenant in the Philippine military intelligence and was recently promoted to the rank of captain by Brig. Gen. Weaver.

Kuno Doerr, Jr., assistant general manager, Utah Division, American Smelting & Refining Co., has moved his headquarters from Garfield, Utah, to the company's offices in the McCormick Building, Salt Lake City, Utah.

E. J. Eisenach has resigned his position with Phelps Dodge Corporation at Jerome, Ariz., and is now with the Rocky Mountain Fuel Co., Denver, Colo.

C. E. Golson is now metallurgist for the American Smelting & Refining Co., in its new lead-zinc flotation plant, near Chihuahua, Mexico.

W. G. Haldane, formerly superintendent at Uravan, Colo., for the United States Vanadium Corporation, has been made assistant general superintendent of the corporation, with offices at the company's headquarters, 30 East 42nd Street, New York City. **A. H. Coleman** has been made superintendent at Uravan; **Walter Vidler** is mine superintendent at the Rifle, Colo., operations of the company, and **L. H. Norton** is in charge of the property at Red Lodge, Mont.

Charles E. Basso is now in Bolivia, associated with the Compania Minera Unificada del Cero de Potosi, at Potosi.

O. L. Alexander, president, Pocahontas Fuel Company, operating in West Virginia and Virginia, was recently elected a director of the Irving Trust Company, New York City.

Lawson W. Cardner has been appointed section foreman of the Mountain Fuel Company, Flemington, W. Va.

A. J. Pew, formerly preparation manager, McAlpin Coal Company, McAlpin, W. Va., has been appointed superintendent of the Wyoming mine of the Red Jacket Coal Corporation, Wyoming, W. Va. **A. W. Cook**, Red Jacket Coal Corporation, has been promoted from general mine foreman of Junior mine to superintendent of the No. 6 mine.

The Marion Steam Shovel Company, Marion, Ohio, announces the appointment of **J. A. Riley**, district manager of its New York office, as export manager. His headquarters will be the Marion Steam Shovel Company, Graybar Building, 420 Lexington Avenue, New York, N. Y., after May 1. This will supersede the present address which is now in the Chrysler Building. Mr. Riley will still remain district manager.

H. W. Dodge of Bronxville, N. Y., has been appointed assistant deputy director of the Materials Division, according to an announcement by William L. Batt, Director of Materials. Mr. Dodge has been general sales manager of the Texas Company since 1933 and has been connected with the organization since 1904. He has been connected with the Materials Division since December 29, 1941, as a general assistant to the Director. Mr. Dodge will take over a part of the duties of A. I. Henderson, Deputy Director.

— *Obituaries* —

Abel B. W. Hodges, mining engineer and geologist, died early in April in Los Angeles, Calif. Mr. Hodges was a metallurgist, obtaining his early experience as superintendent of the Socorro smelter, Socorro, N. Mex. Later he was superintendent of the San Louis Potosi smelter, San Louis Potosi, Mexico. From 1896-1900 he was general manager of the Granby Consolidated Mining and Smelting Company, Grand Forks, B. C., and from 1900-10 he was general manager of the Cerro de Pasco Mining Co., Peru, S. A. He was also the inventor of a special automatic charging car for copper furnaces. He was 79 years old.

Harvey G. Conrad, general manager of the Knox Consolidated Coal Corporation, Bicknell, Ind., died March 16.

Samuel D. Warriner, former president of the Lehigh Navigation Coal Co., died recently in Philadelphia.

W. H. Bowen died early in April at his home in Bramwell, W. Va. He was 82 years old. Mr. Bowen was chairman of the board of the Pocahontas Fuel Co., Inc., and formerly an official of the Booth-Bowen Coal & Coke Co., which suspended operations in 1938. He was a native of Ashland, W. Va., and went to work at the age of 16 for the Philadelphia & Reading Coal & Iron Co. He came to Mercer County in 1887 as secretary of the Booth-Bowen Coal & Coke Co., later becoming treasurer and president. He is survived by his widow, Mrs. Harriet Hopkinson Bowen, four sons and three daughters.

Edward T. Fishwick, vice president and director of the Worthington Pump and Machinery Corp., died on March 15 at his home in Glen Ridge, N. J. Mr. Fishwick had been with the Worthington organization for 49 years, having started work with the corporation in Cincinnati.

Alexander W. Jordan died late in 1941 at his home in Ogdensburg, N. J. He received his E.M. degree at Lafayette College in 1915 and immediately thereafter was employed by the New Jersey Zinc Co., at the Franklin mine. He served in the last World War, and upon his return from service he was employed by the New Jersey Zinc Co. at the Sterling mine, Ogdensburg, where he was assistant superintendent.

W. A. Ellison, president of the Southern Coal & Coke Co., died recently at his home in Knoxville, Tenn.

John T. Barnett, of Denver, Colo., died suddenly early in February. Mr. Barnett was a member of the Board of Trustees of the Colorado School of Mines and in 1939 that institution conferred upon him the degree, Honorary Doctor of Engineering.

Miles M. Carpenter died in Tucson, Ariz., March 20. Mr. Carpenter was well known in western mining circles, having practiced mining in Nevada, New Mexico, California and Arizona. In 1938 he was chairman of the Tucson Council, Arizona Small Mine Operators Association, and later was field engineer for the Arizona Department of Mineral Resources.

NEWS and VIEWS

Allocation of Critical Materials For Mining Equipment

An A-1-a preference rating has been granted mining machinery manufacturers operating under P-56-a by WPB. Effective during the second calendar quarter ending June 30, 1942, this rating is to be assigned to specified percentages of the manufacturers' requirements as listed by them on Form PD-25A.

This in effect provides an actual *allocation* of critical materials for the manufacture of mining machinery. The "Determination" of W. L. Batt's Requirements Committee, dated April 4, was implemented through the use of the A-1-a preference rating, together with provision whereby manufacturers' orders for the materials thus authorized are to be filled 100 percent, notwithstanding any percentage quotas or other restrictions that might otherwise apply. This is particularly important as to steel plate, copper and similar scarce materials.

In general it is understood that the amounts approved for the second quarter on Form PD-25A are in excess of the estimated requirements for this quarter, with a view to remedying some of the deficiencies in delivery in the first quarter.

WPB officials state that this action will insure deliveries of specified quantities of materials to mining equipment manufacturers and provide repair parts for mines and smelters. Control of the ratings will be in the hands of the Mining Branch of WPB under Dr. Wilbur Nelson. Mining machinery makers must report to the Branch each Monday all orders they have placed through the previous Saturday. Amounts of each of the 81 items purchased will be entered against the quota for that particular company and further purchases under the A-1-a rating must cease when the quota is reached.

WPB's action in this matter, which resulted from intensive work on the part of the Mining Branch with the close cooperation of the Mining Congress' Manufacturers Committee again recognizes the paramount importance of mining to the war program. It is important that all concerned extend the fullest cooperation with both the spirit and the letter of the order, through limiting purchases, conserving supplies, reducing inventories and making substitutions wherever possible.

Another amendment to Order P-56-a broadens its application by permitting manufacturers to use materials obtained through its provisions in equipment or repair parts for delivery to South American copper companies operating under Preference Rating Order P-58, to iron and steel producers under P-68 and to smelters under P-73. Upon application special permission may also be given by the Industry Operations Director for deliveries of material obtained by using ratings assigned under P-56-a to fill other rated orders.

Proposed Trade Agreements May Affect Minerals

Acting Secretary of State Sumner Welles has announced the intention of this government to negotiate trade agreements with Mexico and Bolivia. Hearings on both agreements will be held May 18.

Numerous mineral commodities are involved in the agreements. In announcing the intent to negotiate with Bolivia, the Acting Secretary stated that all information and views concerning tungsten ore and concentrates which were presented to the Committee for Reciprocity Information during the consideration of the Peruvian agreement will be considered by the trade agreements organization in connection with the Bolivian negotiations, and that interested parties need not resubmit the information presented on these commodities unless they so desire. Under discussion in the Bolivian negotiations will be tungsten ore and concentrates, now bearing a duty of 50c per lb.; lead bearing ores, flue dust and mattes of all kinds, now rated at 1½c on the lead content; zinc-bearing ores of all kinds, now at 1 1/5c per lb.; antimony ore, now on the free list; and tin ore, now on the free list. Each of the existing duties is subject to a possible reduction of as much as 50 percent, except in the case of zinc ore, on which the statutory duty of 1½c a pound has already been cut 20 percent in the Canadian agreement of 1938. Articles now on the free list are subject to "freezing" of that status.

A wide range of mineral products is contained in the announcement of the proposed Mexican negotiations. This list includes: zinc oxide and leaded zinc oxides; zinc sulphate; fluorspar; graphite; molybdenum ore or concentrates; antimony as regulus or metal; quicksilver; lead-bearing ores, flue dust and mattes of all kinds; lead bullion or base bullion, lead in pigs and bars; lead dross, reclaimed lead, scrap lead; zinc-bearing ores of all kinds; slab zinc; zinc dust and sheet zinc; tin and silver articles; sulphuric acid; antimony ore; arsenious acid or white arsenic; and metallic mineral substances in a crude state.

Demand for Coal Opens Mining Property in Alaska

The Premier Coal Mine was flooded in 1933 and remained closed up to about ten months ago when a rehabilitation program started under the supervision of Otis Ross of the Anchorage Coal Company. It is planned to maintain operations on a three shift basis, providing sufficient labor will be available. Initial operations will begin above the present water level of the property and coal shipments will be made to Anchorage four times weekly over a standard gauge track. The Premier mine was first opened in 1920. The coal requires no working or sorting, except ordinary washing.

Explosives For Mining Companies

Mining enterprises operating under P-56-a have been granted the right to apply their A-1-c rating to obtain explosives and explosive equipment. Previously, explosives could only be obtained as operating supplies, to which an A-8 rating applies. The new amendment adds explosives and explosives equipment to the types of machinery and equipment on List A of the order, and permits use of the A-1-c rating, within the limits of each mine's quota, to obtain such items as detonators, etc.

L. E. YOUNG
Consulting Engineer
Mine Mechanization
Mine Management
Oliver Building **Pittsburgh, Pa.**

PETER F. LOFTUS
Consulting Engineers
ENGINEERING AND ECONOMIC SURVEYS, ANALYSES AND REPORTS ON POWER APPLICATIONS AND POWER COST PROBLEMS OF THE COAL MINING INDUSTRY
Oliver Building **Pittsburgh, Pa.**

Mine Cars and Locomotives Exempt From Freezing Order

A limitation order, freezing all locomotives and railroad cars in the hands of producers and forbidding deliveries of the same without prior approval from WPB, will likely not apply to underground mine cars and locomotives. It is understood that the WPB will shortly issue an amendment to the freezing order exempting mine cars and locomotives from its provisions.

London Experiences Its First Coal Rationing

The Secretary for Mines rationed coal allowing 600 pounds of coal for household use in London for a six weeks period from February 28 to April 12. This was the first definite rationing of the fuel and was due chiefly to the heavy drain on stocks during cold weather.

High Asbestos Production Reported in 1941

Sales of domestic asbestos, which reached 24,391 short tons in 1941, were the highest in the history of the industry, exceeding those of 1940 by 22 percent, according to the Bureau of Mines, United States Department of the Interior. Their value was 8 percent greater than in 1940. Most of the United States production is of the shorter grades of chrysotile, but long-fiber chrysotile obtained in Arizona is attaining increasing importance. During recent years domestic production has supplied only 4 to 8 percent of national requirements, the balance being imported.

Canada, as for many years, supplied most of the United States imports. Canadian chrysotile is of superior quality and is a satisfactory raw material for most asbestos products. African chrysotile, which has been imported in considerable quantity during recent years, is interchangeable with Canadian asbestos for many uses, and a continuation of such imports is highly desirable to supplement the supply of Canadian long fiber.

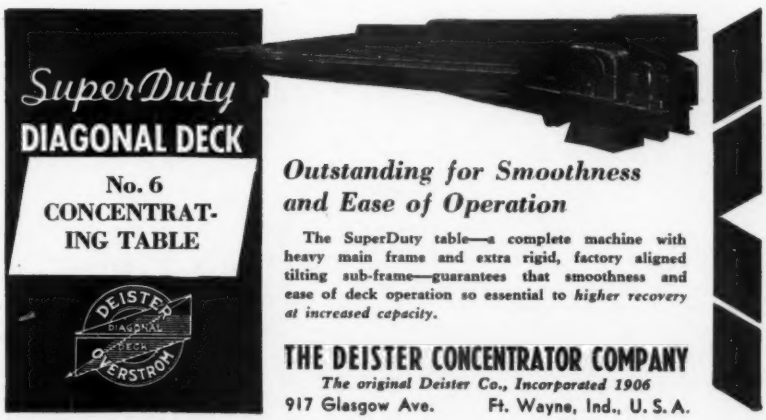
Chrysotile obtained in Rhodesia and, to some extent, in other African localities is very low in iron and, therefore, is preferred for the manufacture of electrical tapes and other equipment designed for high electrical resistance. Canadian chrysotile contains considerable magnetic iron oxide (magnetite, Fe_3O_4) and, therefore, is less suitable than the African fiber for the more exacting uses. Furthermore, certain varieties of asbestos such as amosite and crocidolite (blue), obtainable in quantity only in Africa, are adapted to specialized uses for which Canadian fibers are less suitable. For instance, amosite can be made into insulation mattresses of exceptionally low weight per cubic foot and, therefore, is well adapted for use on naval vessels; and blue asbestos is so resistant to chemical action that it is preferred for acid filters and as an important constituent of acid-resistant asbestos-cement pipe.

The Granite Mountain Mine, of the North Butte Mining Company, is near Butte, Montana on the "Richest Hill in the World"

North Butte Mining Company Plans Production

Arrangements have been made by the North Butte Mining Company for an operating contract with the Anaconda Copper Mining Company. Under the arrangement, the North Butte Company will have the advantage of the prices quoted by the Metals Reserve Company, that is 17 cents for copper, 11 cents for zinc and 9¼ cents for lead. These prices are effective from February 1, 1942, for a period of 2½ years.

In a report to the stockholders of the North Butte Mining Company, Mr. Paul A. Gow of Butte, president and general manager, said, "Up to July 31, 1944, unless sooner terminated by 30 days' notice of either party, Anaconda is to mine, transport, mill and smelt ore extracted from the Granite Mountain Mine and refine and deliver 90 percent of copper content f.o.b. Connecticut Valley to order of Metals Reserve Company for account of North Butte Mining Company at various costs ranging from 16½ cents per lb. of copper produced from ores of 3.25 percent grade to 12 cents per lb. of copper from ores of 5.25 percent grade. Ores of less than 3.25 percent grade and entailing a higher cost than 16.5 cents per ton of copper may be stockpiled by direction of North Butte, and if shipped contrary to such direction, Anaconda will deliver 80 percent of the copper content at a cost of 16 cents per lb. The cost of reopening the Granite Mountain Mine and placing it in production through the workings of the Badger State Mine of Anaconda is assumed by Anaconda Copper Mining Company and included in the above costs without liability or obligation on the part of the North Butte Mining Company. North Butte shall receive 90 percent of the copper content of all mine waters drained from its property and shall pay therefore a pumping and treatment cost of 15 cents per lb. Production from development work on the 3,200 and 3,400 ft. levels has already started."



Outstanding for Smoothness and Ease of Operation

The SuperDuty table—a complete machine with heavy main frame and extra rigid, factory aligned tilting sub-frame—guarantees that smoothness and ease of deck operation so essential to *higher recovery at increased capacity.*

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RFC Adopts Plan for Small Mine Loans

Commerce Secretary Jesse Jones has announced that the Reconstruction Finance Corporation has adopted a plan under which the owner or lessee of mining property that gives reasonable promise of success may now secure a loan from the RFC, payable out of proceeds from production without placing a mortgage on the mining property. Under the plan these mining development loans will be made initially in amounts not in excess of $20,000. If results of development under this loan prove favorable, additional loans up to $20,000 will be made for further development. To facilitate procedure, RFC engineers will be placed in mining areas to assist in preparation of applications and to examine properties coming in for loans.

A recent RFC bulletin on development of mining loans sets forth the position under which applications will be accepted. The applicant must be a United States citizen, partnership, or corporation, and must be the owner or lessee of the mining property before a loan may be obtained.

If the data set forth in the application indicate that the property should be developed, the RFC will examine the property at its own expense and any development loan authorized will be made on the following basis: (1) The loan will be secured by a note payable only out of proceeds of production of the mining property. (2) The RFC may require a chattel mortgage covering only the equipment purchased with the loan from, or it may make other arrangements regarding a lien upon the equipment purchased. (3) Loan will be made available as the development requires. In making an application for a development loan the borrower must furnish data to show that there are exposures of ore or mineral within the mining property which warrant development, and should also furnish the following information:

1. In the case of a lode or vein mine and map of the surface of the mine workings (both if available) should provide with the location of every sample taken of the ore exposures plotted upon it, together with the width of ore each sample represents and its assay value.
2. In the case of a placer, application should contain a map showing the location of every shaft or drill hole sunk during the prospecting operation, together with a value per cubic yard recovered from the gravel of each. A detailed description of the method used in making value determinations is essential. If holes were drilled the log of each hole should be submitted.
3. A proposed plan of the development work to be done, outlined upon the maps.
4. An estimate of the cost of doing the development work.
5. An estimate of all proposed expenditures from loan funds.
6. An inventory of all usable equipment on the property.
7. A list and description of the new equipment to be purchased, together with cost estimate.
8. Complete information concerning the cost and source of water and power.

Degassing Coal Mines

Visions of today may be the actualities of tomorrow. In a recent issue of the News Bulletin of the Engineering Experiment Station of Ohio State University, Leo Ranney suggested the possibility of boring long, horizontal wells in gassy coal beds to recover the methane in advance of mining. The method as suggested is similar to the horizontal drilling methods which have been developed for the recovery of oil from oil sands.

The plan as suggested by Mr. Ranney would have several advantages, one of which would be the recovery of gas for utilization, since some seams are estimated to contain as much as 22,000,000 cu. ft. of gas per acre. Other advantages would be reduction of mine ventilation, since the gases would be extracted before the coal is widely opened up, and a lessening of explosion hazards in the mine.

The suggested plan would be to drill parallel, horizontal wells 4,000 to 5,000 ft. long in the coal seam and spaced 800 ft. apart, the first 400 ft. of which would be cased and grouted. A high vacuum would then be maintained on the completed well to remove the gas from the coal to a distance of 400 ft. on both sides of the wells.

Tungsten Deposits in Utah Examined

As a part of the investigation of domestic deposits of strategic minerals by the Geological Survey, United States Department of the Interior, one of the Survey's geologists, S. W. Hobbs, assisted by Frank Byers, has examined several tungsten deposits in the San Francisco and Rocky mining districts, Beaver County, Utah. The deposits are all near Milford, Utah.

The tungsten mineral in the deposits is scheelite, which occurs in metamorphosed limestone along its contact with igneous intrusive quartz monzonite. The mineral shows an unusually yellow fluorescence under ultra-violet light. This is probably due to the presence of molybdenum, but the intensity of the color varies even in a single crystal, suggesting that the ratio of molybdenum to tungsten is also variable. Although scheelite has been found at many places in the area, it is most abundant at the Cupric mine and the Copper Ranch mine, both owned by the Cupric Mining Co., and at the Old Hickory mine, now being operated by C. H. Segerstrom.

"These days the company is taking every precaution with its workmen."

Safety Engineering.

Wheels of Government

(*Continued from page 37*)

40,000 tons of silver for use in bus bars and certain other functions in federally financed war production plants, thus permitting an equivalent amount of copper to be placed in other war services.

Constantly on guard because of the importance of silver prices to the base metal miners of the west, Senator Pat McCarran and eleven other western senators recently met with Treasury Secretary Morgenthau and discussed informally with him his recent statement to the effect that "as far as I am concerned you can remove all of the silver legislation from the books." Accompanied by the Treasury's general counsel E. D. Foley, Jr., and its monetary expert Dr. H. D. White, the Secretary told the Senators that the statements which he had made were his own personal opinions and did not necessarily represent the views of the Treasury. Mr. Morgenthau made the further interesting statement that, contrary to recent reports, the Treasury does not contemplate making any recommendations to Congress for the repeal of existing silver legislation. The Secretary's remarks refer particularly to the statutory remonetization of silver in 1939 and to the Silver Purchase Act of 1934.

Trade Agreements—Mexico, Bolivia

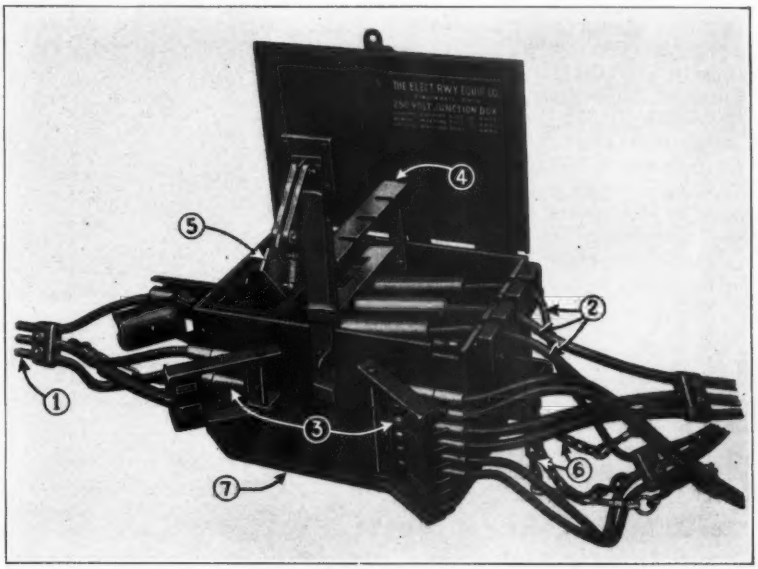
Briefs coming from a wide range of mineral producing districts have been filed with the Committee for Reciprocity Information as the result of the announcement by the State Department of intention to negotiate a foreign trade agreement with the Republic of Mexico and also with the Republic of Bolivia. A general statement in behalf of the industry as a whole is being submitted by the American Mining Congress.

Listed as subject to reductions in duty under the proposed Mexican agreement were zinc oxide and leaded zinc oxide, zinc sulphate, fluorspar, graphite, molybdenum ore or concentrates, antimony as regulus or metal, quicksilver, lead-bearing ores, flue dust and mattes of all kinds, lead bullion or base bullion, lead in pigs and bars, lead dross, reclaimed lead, scrap lead, zinc-bearing ores of all kinds, slab zinc, zinc dust and sheet zinc. Sulphuric acid, antimony ore, arsenious acid or white arsenic, and metallic mineral substances in a crude state, are subject to "freezing" on the free list.

Listed under the proposed Bolivian agreement are tungsten ore and concentrates, lead-bearing ores, flue dust and mattes of all kinds, zinc-bearing ores of all kinds, antimony ore, now on the free list, and tin ore, now on the free list.

Under the Trade Agreement Act commodities on which the duty has not previously been reduced (zinc was cut 20 percent in the last Canadian agreement) are subject to a reduction of as much as 50 percent. In the case of commodities now on the free list the Trade Agreement may "freeze" them in that status. Oral presentations will be received by the Committee for Reciprocity Information beginning May 18, when it is anticipated that a great many mineral producers as well as Senators and Representatives from mining states will testify before the committee.

. . (*Continued on next page*)



PAT. APPLIED FOR

The ELRECO No. 1228 JUNCTION BOX for D.C. circuits is the essential safety link between the power source and the coal mining equipment.

7 Features Guarantee Safe and Efficient Service

No. 1. 3-Wire incoming power circuit cables (Pos., Neg. & Safety Ground). Safety chain and clamp relieves all strain on cable terminals.

No. 2. Out-going positive cables for machine, loader and drill circuits, equipped with removable socket connectors having insulated handles.

No. 3. Pin and socket type connectors for all negative and safety ground cables; mounted on the outside of box to secure complete separation from positive circuits.

No. 4. Safety lever which must be lowered before main switch can be closed. This lever automatically locks all terminal connections in position and prevents any circuit being opened under load.

No. 5. Quick Break Switch operated by the opening or closing of hinged junction box lid.

No. 6. Detachable strain chains and clamps for each individual circuit and which prevents any strain on cable connector terminals.

No. 7. Bottom skids to facilitate moving of box to different locations.

Standard equipment includes 200, 100 and 35 ampere 250-volt enclosed fuses —solder type terminal connections eliminate necessity of all vulcanizing or splicing of cables, and 28" height of box permits use in low coal seams.

The Electric Railway Equipment Co.

2900-18 Cormany Ave. **Cincinnati, Ohio**

Wheels of Government

(*Continued from page 45*)

WPB Mining Branch Aids Industry

Implemented by the use of an A-1-a preference rating, together with a provision whereby manufacturers' orders for authorized materials are to be filled 100 percent, the "Determination" of W. L. Batt's Requirements Committee issued under date of April 4 is accomplishing the allocation of critical materials for the manufacture of mining machinery. The WPB Mining Branch under Dr. Wilbur Nelson will control this allocation which will be effective during the second calendar quarter ending June 30, 1942. Worked out by the Mining Branch and the American Mining Congress Manufacturers' Committee this action by the WPB is of incalculable importance to all branches of the industry.

A further clarification has been made by the Mining Branch concerning the addition of explosives and explosives equipment to schedule "A" under order P-56. The amendment permits the use of an A-1-c rating but it is intended only to be used for procurement of repairs to blasting machines and similar equipment. Ordinary consumable operating supplies such as explosives and detonators can still be secured with the lower rating of A-8 or even with an A-10 under P-100.

Soviets Reopen Coal Mines Taken From the Germans

According to a spokesman of the Peoples Commissariat for coal mining of the U. S. S. R., over 60 Soviet coal mines have already been restored in the Donnets and Moscow areas liberated from the Germans. Production has resumed in these pits and Russia's coal output is constantly growing. Many of the restored coal mines are reported to be already exceeding their schedules. Other pits in these regions, cleared of the Germans, are also being rapidly reopened.

Canadian Magnesium Production

The Consolidated Mining and Smelting Company of Canada, Ltd., will immediately go into the production of magnesium; it is understood that ore from the Marysville mine, near Kimberley, will be treated. Here, a large and conveniently situated deposit of crystalline, rock magnesite is known to exist. The site of the plant has not been announced, but it is likely that it will be in the West Kootenay area, where a plentiful supply of electric-power is available. Initial capacity of the plant will be at the rate of 15 tons per day, which may be increased at a later date if conditions should warrant.

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WAR PRODUCTION
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Sectionalizing
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doing their part
Sectionalizing Circuit Breakers help raise production, reduce fire hazards, lower maintenance charges and decrease total energy consumption and power demand.
Write for a copy of "D-C Circuit Breakers, Switchgear and Protective Relays for Mining Applications". Catalog 2502.
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Representatives in Principal Mining Areas
I-T-E CIRCUIT BREAKER CO.
PHILADELPHIA, PA.

Important Metals From Mines In The Coeur d'Alene

Production of important metals for war is steadily increasing in the Coeur d'Alene district of Idaho. The Sunshine Mining Company, known as the nation's premier silver producer, had an output of nearly 2,000,000 lb. of antimony as a by-product in 1941. It is estimated output of antimony from the Coeur d'Alene Mines Corporation will be double that of its 1941 output. Bunker Hill and Sullivan, leading lead-zinc producer of the State, accounted for more than 2,000 tons of antimony last year. Sunshine and the Coeur d'Alene Mines Corporation are obtaining equipment for operation under P-56 due to their production of antimony and copper.

Strategic Mineral Fields Attract Alaska Juneau

Production of gold ore by the Alaska Juneau Gold Mining Company in 1940 totaled 4,354,770 tons against 4,739,790 tons in the previous year, with the value of ore averaging $1.004 per ton compared to .938 cents in 1940. Commenting on the difficulties of gold mining in wartime, Mr. P. R. Bradley said, "The situation generally has become more adverse, the priority privileges of the industry are being lessened, labor is not only harder to get, but we are faced with a conscription of labor; freight rates from Alaska, together with war risk insurance, have been substantially increased and the whole outlook is bound to grow more unfavorable." Mr. Bradley said there was a decrease of over 1,000 tons per day in mine output due to labor shortage (labor turnover last year reached the highest point in the mine's history, the average percentage being 10 percent or three times normal). This reduction in tonnage was balanced by an increase in operating profit of 2.8 percent per ton mined. He said that the company will devote all efforts to use its facilities for creating profitable enterprises in the so-called strategic mineral fields.

CORRECTION

A letter from J. B. Mavor, managing director of Mavor & Coulson, Ltd., Bridgeton, Glasgow, S. E., points out two errors in the following caption that appeared on Page 50 of the November, 1941 MINING CONGRESS JOURNAL. "The English are beginning to produce equipment for trackless mining. The Arc Shearing Coal Cutter shown is made by Mavor & Coulson. It will cut up to 10 feet, 6 inches, it has a 10 ft. turn radius and is powered from a cable reel. It has six pneumatic tires." In his letter Mr. Mavor advises, (1) the machine is Scottish not English, and (2) it is now nine years since the firm of Mavor & Coulson made their first trackless cutting machine.

Coal Industry Being Studied for Capacity Production

A study to determine the existing and potential ability of the bituminous coal industry to supply war needs and a survey to determine the availability of mine labor for both anthracite and bituminous coal have been undertaken by the Solid Fuels Coordination Office. The necessity for a special study of anthracite capacity is under consideration and an early announcement as to the decision reached is expected.

The mine capacity study for the bituminous industry will be made by bituminous coal producer boards. Purpose is to determine the amount of the different kinds, qualities and sizes of coal that the mines can produce with their present facilities, and to provide information as to the amount of labor, supplies and equipment that they will need to maintain their present capacity or would need to expand production capacity when necessary. Acting Director Gray said that the surveys would be made to eliminate guess work from the handling of the fuel supply.

1941 Value of Mineral Products Estimated To Be $6,600,000,000

The value of mineral products in the United States last year—estimated at $6,600,000,000 by the Bureau of Mines—increased 18 percent over 1940 and reached the highest peak in history with the exception of the year 1920, when prices were abnormally high following the first World War, according to estimates submitted to Secretary of the Interior Harold L. Ickes by Dr. R. R. Sayers, Director of the Bureau.

Preliminary data collected by the Bureau of Mines, chiefly for use of war agencies, indicated that while a general advance in price levels of minerals accounted in part for the increased value, the major factor was the substantial gain in output of both metallic and nonmetallic products achieved by the nation in 1941.

Many of the mineral products essential for normal needs and for successful prosecution of the war, such as aluminum, magnesium, zinc, iron ore, natural gasoline, petroleum, and coke, were produced last year in quantities never before equalled in the United States. Other important mineral products including coal, copper, and manganese ore showed increases over the preceding year ranging from four percent to as much as 89 percent.

Sunshine Mining Manganese Oxide

Sunshine Mining Company's development of "hausmannite" ore, oxide, of manganese, on the Olympic peninsula is described by the U. S. Geological Survey as an important addition to the domestic manganese output so badly wanted for war industries. In describing the Olympic deposits, the Survey says:

"The peninsula is an extremely rugged and heavily timbered area of about 5,000 square miles. The tightly folded argilites, graywackes, schists and quartzites in the center of the peninsula are bordered by steeply-dipping lava flows and tuff beds.

"Red beds of argilite and limestone, much squeezed and faulted, contain lenses and pockets of manganese silicates and a few bodies of manganese silicate deposits are low grade and are accompanied by jasper which makes them hard to concentrate.

"Hausmannite is the only commercial source of manganese yet developed on the peninsula and so far it has been produced only from the Crescent Lake property, which in 1924 and 1925 yielded 16,275 tons of ore of an average manganese content of more than 51 percent. Another similar small body of hausmannite is being mined at the Crescent property by the Sunshine Mining Company of Wallace, Idaho.

"It is doubtful whether the peninsula can yield 150,000 tons of ore containing more than 20 percent of manganese."

Screening Facts

Not Just Claims

PREPARATION and concentration plants throughout the Mining Industry all agree that their screening equipment is the heart of their plant and to produce profits, must function efficiently. Simplicity Gyrating Screens do fulfill this requirement. The best proof of this fact is that over 1300 operating plants, each having from one to forty-six Simplicity machines, are on our list of known users.

In one coal screening operation, a 6′ x 16′ shaker screen was replaced by a 5′ x 12′ Simplicity Gyrating Screen. With the shaker screen, 85 minutes were required to load one carload of egg coal. With the Simplicity Screen, only 20 minutes were required and in addition 15% more coal was recovered.

The Simplicity Gyrating Screens are outstanding in their freedom from external vibration, so they can be placed in tipples and bridges without concern over possible damage to the supporting structure. This feature, combined with their large capacity and freedom from the usual maintenance costs, has established them as favorites with all their users.

For screening facts, ask your Simplicity Representative or write for descriptive bulletin

Simplicity Engineering Company

DURAND, MICHIGAN

"ALL RAIL JOINTS ARE THERMIT WELDED"
"THERMIT WELDING OF JOINTS WAS ADOPTED EARLY IN 1935"
"THREE MINES IN THE REGION THERMIT WELD THEIR TRACK"

IN reading descriptions of modern coal mines, one constantly comes across references to Thermit welding of main haulage track.

For in the continuous effort to streamline operations and cut costs, Thermit welding is recognized as an important factor.

Careful cost records have shown that, over the life of the track, Thermit welding has cut the cost of a joint by more than 20%, compared with an angle-bar and bond joint.

Longer rail life, due to absence of wear on rail ends, smoother operation of cars, and less wear and tear on rolling stock are other advantages of Thermit welded track.

★★★ **VICTORY NOTE** ★★★

Tremendous demands for aluminum for war production have caused a temporary shortage of Thermit for rail welding. You will want to keep this ideal rail joint in mind for the future, if you cannot get Thermit today.

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120 BROADWAY • NEW YORK, N. Y.

ALBANY • CHICAGO • PITTSBURGH • SO. SAN FRANCISCO • TORONTO

Specialists in welding for nearly 40 years. Manufacturers of Murex Electrodes for arc welding and of Thermit for repair and fabrication of heavy parts.

Track Welding

(*Continued from page* 10)

temperature of the 85-lb. rail to the proper welding temperature, which is about 1750° F., or when the rail ends reach a bright cherry red. When this proper temperature is reached, the heating gate hole is plugged.

The joint is now ready for welding. The Thermit mixture, composed of iron oxide and powdered aluminum is supplied by the manufacturer in waterproof paper bags, each bag containing the proper amount of Thermit for the particular rail section to be welded. The contents of a bag is placed in a conical shaped crucible that is so constructed that it may be tapped from the bottom, thus permitting the molten steel to enter the mold. A special Thermit ignition powder is placed on top of the Thermit and ignited with a red hot rod. The ignition powder generates sufficient heat to start the Thermit reaction. The reaction requires 25-30 seconds, after which the molten steel is ready to be tapped into the mold. The molten steel enters at the pouring gate and completely fills the mold. The weld is allowed to stand until the steel is thoroughly solidified or for approximately five minutes.

After the steel has solidified the mold boxes are removed and the sand that adheres to the rail is knocked off. The weld is then rough dressed with a hot cutter and a sledge hammer while still at a red heat. (See Fig. No. 6.) After the joint has cooled, it may be finished with a track grinder on the top and on the gauge side. It is obvious that work on other joints should be carried on at the same time, so that labor will be most economically used. The equipment at Kopperston is designed to enable at least four joints to be underway at a time.

The resistance of a properly Thermit welded joint is the same as for the rail itself, showing a perfect bonding. Experience at this mine shows that the number of breaks occurring are about equally divided between bolted and welded joints. However, when breaks do occur in welded rails, they invariably come at a bolt hole and not next to or through the weld, indicating that no weakness has been caused by crystallization.

The costs of the two types of joints in this mine for 85-lb. rail are as follows:

Thermit welded joint....	$6.67
Bolted and bonded joint..	4.44

The following are some of the advantages of a properly welded joint over the bolted type:

1. Elimination of rail bonds and their maintenance.
2. Decreased power losses due to better conductivity of return circuits.
3. Less need for return feeders.
4. Decreased maintenance cost of rolling stock.
5. Elimination of electrolysis and consequent longer life of track.
6. Decreased track maintenance.
7. Reduces spillage to a minimum, and thereby nearly eliminates track cleaning.

Scrap Metals

(*Continued from page* 20)

gram, the operation of which is similar in character to the program set up by the Industrial Salvage Section. Technical advisors in the section and from the armed forces are called on for mutual aid and advice, which has resulted in a high degree of efficient operation.

In closing, let me observe that this is in reality a war of materials and supplies. We have sufficient food and oil available. We have, I believe, sufficient supplies of needed metals—enough to satisfy the terrific, all-absorbing appetite for planes, guns, ships, etc.—but we have to find it—dig it out—move it immediately into the flow. It's my job to do that—it's your job—and it's every American's job.

Before I close, allow me to offer the following as a practical pattern: Appoint a salvage director and give him the authority to act. Decide right away what should be re-used, reclaimed or scrapped. Segregate your scrap piles—keep them free from dirt and contamination. Prevent waste by better purchasing, better engineering, better production, packing and shipping.

Find markets for equipment and surplus stocks which some other plant can use. Keep a list of scrap dealers and yards on hand through which various types of scrap can be speedily turned back into production.

Keep the enthusiasm among the employes high by devising incentives and awards for conservation work.

Establish and keep frequent contact with the Industrial Salvage Section.

Keep up the Salvage Program every day—every week and every month.

Coal Convention

(*Continued from page* 39)

to have the equipment designed so that it can be moved to new localities at a minimum expense.

The opportunity to relax and meet friends came at the King Coal Club that evening, where a varied program of good entertainment brought cheer and good fellowship to all who attended.

Phases of Safety Are Important to the Industry

Operators are aware of the difficulties training inexperienced or green men in the coal mines, and the subject of safety is of outstanding importance. Papers on Tuesday morning covering this subject were presented, with E. R. Price, general superintendent, Inland Steel Co., Wheelwright, Ky., acting as session chairman. He introduced E. L. Lubelsky, engineering manager, Powhatan Mining Co., who discussed in detail the subject, Explosives—Handling and Distribution Underground. Mr. Lubelsky's broad experience in the anthracite and bituminous industry is authority for the warning he made that powder and blasting caps are unpredictable, and in spite of the achievements won in the manufacture of explosives today, every piece should be handled with utmost care by inexperienced as well as experienced miners. He discussed a series of graphs, among which showed five-year average fatality index for premature explosions expressed in terms of million pounds of explosives per fatality. His conclusions struck unanimity of opinion among his listeners when he said that no new or more regulations are needed, but what is needed, is careful supervision of the handling of explosives to make it as safe as possible.

Mine Ventilation and Sealing Abandoned Areas was the title of a paper presented by Walter E. Buss, mining engineer, Knox Consolidated Coal Corp., Bicknell, Ind. He described the methods used by his company during the past 26 years in sealing abandoned areas, touching upon hydraulic pressure, construction methods and specifications, testing sealed areas, and the importance of maintenance and inspection of all sealed areas.

Coal Dust Allaying in Cutting, Loading, and Transportation. This new and important practice was presented in a paper by J. C. Johnston, general inspector, Koppers Coal Division, Eastern Gas & Fuel Associates, Kimberly, W. Va. He confined his remarks to the general methods of wetting, employed by his company in reducing the dust hazard and he also described the type of sprays and equipment employed to allay the dust.

Refinements in Coal Preparation Continue Apace

This subject warranted treatment at the meeting this year and under J. S. Forman, vice president, Mt. Olive & Staunton Coal Co., St. Louis, Mo.,

Coaladd

The effective, permanent dustless treatment for coal. Time tested. Shipped as a concentrate in bags.

Easy to mix and apply.

Are you using Compound M for mine dust control?

HAVE YOU SEEN A SAMPLE?

three papers were presented. Wartime Coal Preparation—Maintaining Quality Standards, was the title of a paper presented by W. D. Steele, preparation manager, Consolidation Coal Co., Fairmont, W. Va. He pointed out that the war emergency demands have given indication that the coal industry will be called upon to yield the utmost in tonnages of the necessary quality, grade and sizes. He stressed that full cooperation on the part of both the consumer and the producer must be had in order to meet this unusual demand.

Coal Drying and Other Auxiliaries of Preparation, was the subject of a paper presented by James Hyslop, general manager, Hanna Coal Co., St. Clairsville, Ohio. The author described the many tests made with various types of equipment to produce the required results of coal drying at his company's Piney Fork preparation plant. Several slides were shown covering the operating performance of the equipment used.

Face Preparation—Cutting, Drilling and Shooting, was discussed by F. Earle Snarr, assistant to general superintendent, Chicago, Wilmington & Franklin Coal Co., Benton, Ill. Mr. Snarr confined his comments to experiences gained at his company's property at Franklin County, Ill. The satisfactory operations at this property were obtained as a result of pooling the widely divergent preferences and opinions of the company's miners, foremen and engineers.

Methods and Equipment Employed in Mechanical Loading was the topic presented during an afternoon session with R. E. Salvati, vice president, Island Creek Coal Co., Holden, W. Va., as session chairman. August J. Breitenstein, assistant mining engineer, H. C. Frick Coke Co., Uniontown, Pa., presented a thorough and very well prepared paper on the subject of Track - Mounted Loading Machines. He explained how the problem of applying mechanical loading to the open end mining system was approached with the primary objective that none of the refinements in open end mining could be sacrificed. Accordingly, the problem of mechanization in this system became largely one of adapting cutting, drilling, loading and transportation equipment to the system, rather than adapting the system to the equipment. He told of the emphasis placed by his company upon safety practices in mechanical loading section.

Tractor Loaders with Shuttle Cars was the title of a paper presented by Arthur F. Phillips, superintendent, Peabody Coal Co., Springfield, Ill. Mr. Phillips was unable to attend so the paper was read by C. J. Potter. It described the practice at the No. 59 mine in the Springfield, Ill., district, where the coal is loaded with tractor-mounted loading machines, and transported to a point where it is unloaded from the shuttle car into the elevating conveyor.

Salvage of Scrap Metals was the subject to have been discussed by George T. Weymouth, chief, Industrial Salvage Section, War Production Board, but Mr. Weymouth was unable to attend due to illness. Mr. Weymouth's paper, however, is on page 18 this issue. R. E. Snoberger, salvage director, Coal Mining Industry, War Production Board, spoke and urged all coal operators to collect all useless metal scrap around the mine,

Zinc Industry Airs its Problems and Achievements At 24th Annual Meeting

Aiming to supply the nation with more zinc, members of the zinc industry convened at St. Louis on April 20-21, to discuss its achievements as well as problems in serving the nation's war effort. Howard I. Young, president, American Zinc institute, opened the meeting, stressing the importance of cooperation among all branches, with the government, so as to win the war. Touching upon the subject of having meetings in war time, Mr. Young said: "There was some question in the minds of a number of us in the industry as to whether we should this year take time out from our production and distribution problems to get together for a two days' session to discuss the zinc industry. After Secretary Gent talked with the representatives of the War Production Board, the OPA, the Bureau of Mines, and the Metals Reserve Company, we found that they all urged that this meeting be held this year. As a concrete evidence of their interest and spirit of cooperation, we have 14 men from the various government divisions to take part in our deliberations."

The progress made by the Axis powers in acquiring mineral resources in the present war was the interesting subject that Elmer Pehrson, chief of the Economic and Statistics Branch, U. S. Bureau of Mines, effectively conveyed to his listeners.

W. C. Page, of the Zinc Branch of the War Production Board, told the 200 delegates that industry should be complimented for its early start in increasing production, expected to reach a record 1,000,000 tons this year. "Let's concentrate on winning the war," he said, "instead of worrying about what conditions will be afterward."

When Mr. Young introduced M. L. Trilsch, of the War Production Board, he prefaced his remarks with the comment, "One cannot help but have the highest admiration for the type of work the War Production Board, Office of Price Administration, Metals Reserve and Defense Plant Corporation are doing for the zinc industry." Mr. Trilsch outlined the objectives and the requirements of high grade zinc for the war effort and said 100 percent allocation was in prospect for the producer as well as the consumer.

Russell B. Caples, manager, Great Falls Reduction Dept., Anaconda Copper Mining Co., discussed "The Outlook for U. S. Zinc Mine Production" for the Rocky Mountain States and Western Region. The Mississippi Valley Region was discussed by Evan Just, secretary, Tri-State Zinc & Lead Ore Producers Assn. C. W. Roddewig, Zinc, Lead and Tin Section, Office of Price Administration, conducted a "Mine Quota Clinic" for operators. He said that some of the mine quotas no doubt were not equitable and were too high, and there is a good possibility that these will be revised.

Sessions on Tuesday morning were opened by Dr. W. A. Nelson, administrator, Mining Branch, War Production Board, who discussed "Mine Priorities." Dr. Nelson summarized the progress made by his department and suggested that all mining companies should send in figures of their automobile and truck tire requirements necessary for zinc production. J. C. Gall discussed "Trends in Labor Policies in Wartime."

J. D. Conover, secretary of The American Mining Congress, discussed "Developments in Washington Affairs." Mr. Conover said, "Presumably, neither the zinc industry nor any other branch of the mining industry objects to the removal of duties as a war measure, but we don't feel this is a time to make a permanent cut in the production so necessary to the industry." He also urged members to begin a systematic check at their mines and plants for scrap metal that can be converted into war material.

All officers and ten three-year term directors of the American Zinc Institute were reelected. The officers are: Howard I. Young, St. Louis, Mo., president; C. Merrill Chapin, Jr., New York; James O. Elton, Salt Lake City, Utah; and John A. Robinson, Miami, Okla., vice presidents; John L. Good, Hillsboro, Ill., treasurer; E. V. Gent, New York, secretary. The directors are: Howard I. Young, S. A. Easton, James O. Elton, Clarence Glass, J. E. Hayes, A. L. Queneau, J. W. Hegler, H. W. Logan, and Geo. W. Potter and Jesse E. Starr, both of Joplin, Mo.

particularly iron and steel, and get it into the flow for the production of tanks and ships.

Another session on Strip Mining was held Tuesday afternoon, with K. A. Spencer, vice president, Pittsburg & Midway Coal Mining Co., Kansas City, Mo., acting as chairman. He introduced O. E. May, chief engineer, Northern Illinois Coal Corp., Wilmington, Ill., who presented a paper entitled Shovel Tooth Design and Maintenance. Mr. May pointed out that standardization is not practical as each group of shovel teeth are designed to meet specific and certain requirements in operation.

Strip Mine Haulage was the title of a paper presented by A. D. Henry, assistant superintendent, The Jefferson Co., Wheeling, W. Va. He discussed the haulage problems, particularly in central and western coal fields, where operators were the first to employ truck haulage. He described the large haulage units of several operators in this field, and the maintenance of the highways.

The two-day meeting ended with the annual banquet, Tuesday night. Admiral Thomas C. Hart, United States Navy Commander of the United Nations' forces in the South Pacific area in the early stages of the war, including the Battle of Macassar Strait, was the guest speaker. His subject was "The Situation in the Far Eastern Theatre of War." He described the extent of the Japanese conquests in obtaining natural resources, particularly oil, and said the Japs realizing their long lines of supply for petroleum were vulnerable, and they made heavy expenditures to build a storage for a war reserve. "The Japanese began the war with that oil only in reserve," he said. He added that "if undisturbed in their new possessions, Japan is in condition to become a much stronger world power than a few months ago was believed possible—but," he pointed out, "they are going to be disturbed, disturbed aplenty."

Manufacturers Division

The Manufacturers Division of the American Mining Congress convened at the Netherland Plaza Hotel on April 28. Officers for the 1942-43 term are: Chairman, John W. Haddock, Sullivan Machinery Company; First Vice Chairman, George E. Stringfellow, Thomas A. Edison, Inc.; Second Vice Chairman, H. V. Brown, Brown-Fayro Company.

— *Book Reviews* —

DUPONT—ONE HUNDRED AND FORTY YEARS, *by William S. Dutton. Published by Charles Scribner Sons, New York, N. Y. Price* $3.00.

In 1763, near the village of Chevannes in the Nemours district lived Pierre Samuel du Pont, Esq., son of Samuel du Pont, the watchmaker. Samuel du Pont added "de Nemours," to prevent confusion with two other deputies in the French Chamber of Deputies. Thus in the first page the author explains how and why this famous name became so long. Apparently the first intimate contact with gunpowder and the du Pont family came to Samuel's son Irenee, (a grandson of the watchmaker) when Professor Lavoisier took the young man to the Essonne gunpowder works and showed him how to mix gunpowder. This, however, seems only a youthful incident in the life of Irenee, and it is not until his family lived through the French Revolution and came to the shores of America on New Year's Day, 1800, that the story develops in its interesting style as the biography of a business, and a story of men, of vision and venture, of labor, sacrifice and devotion to an idea. From here on, step by step is revealed the growth and expansion of the du Pont business, encompassing projects that were to benefit the daily life of millions. The reader finds unusual historical interests in the life of this great family through the years, from Irenee's childhood experience with gunpowder, now a secondary product to the numerous chemicals now produced by the company. The book is rich in personalities and adds greatly to the significance of the interesting du Pont museum when one visits the company offices in Wilmington.

SHARING INFORMATION WITH EMPLOYEES, *by Alexander Heron. Published by Stanford University Press. Stanford University, Calif. Price* $2.50.

The author has a broad background in industrial relations and is, therefore, qualified to write on a subject that today is extremely vital, not only to the war effort but the creation by all concerned for a sincere tolerant understanding of so-called capital and labor via the American way. He points out how the industrial growth of America has, in spite of all efforts of company management and labor to understand each other, created a void because there has been no foundation for a program of understanding between employes and employers leading to a complete respect for the personality and individuality of the employe. The title of the book does not mean merely giving facts or information and printed or written form into the hands of employes. The mental processes of each employe must create his own opinion based on true facts why he is such a small but important part of his own economic system. This is not a theoretical dissertation but a practical handling of the subject and it is recommended for the libraries of employers, managers, supervisors, employes and union officials.

BITUMINOUS COAL HANDBOOK. *Compiled by K. P. Casey, member of the Bar of the District of Columbia. Published by Matthew Bender & Company, 149 Broadway, New York, N. Y. Price* $5.00 *at the publishers.*

The title may be somewhat misleading to engineers and mine operators who might infer this handbook as a volume dealing with technical mining problems in the bituminous coal industry.

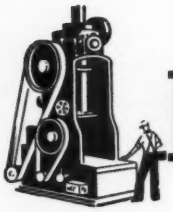
In reality the book is a very complete compilation of the Bituminous Coal Act, therefore, a more fitting title, consistent with the context, might have been, Handbook of the Bituminous Coal Act.

The National Bituminous Coal Act passed by Congress and effective as of April 27, 1937, represents the third attempt by the Federal Government to regulate the bituminous coal industry. The first Act was through the medium of the National Industrial Recovery Act and the second, the Bituminous Coal Conservation Act of 1935. In April of 1941, the Bituminous Coal Act of 1937, originally effective for four years was extended for an additional two years, until April, 1943.

One of the outstanding features of the author's work has been the annotation that covers any pertinent decisions of the court, the statements and rulings interpreting the phraseology, or applicability thereof, which have been issued, either by the National Bituminous Coal Commission during its administration of the Act, or by the Bituminous Coal Division, since its assumption of the functions of the Commission, as well as the decisions of the Comptroller General.

About 300 orders of general applicability to coal producers as well as to wholesale brokers of coal have been issued. These are listed by number, together with footnotes to the pertinent sections of the Act, or the particular rule with which they are concerned, with a notation as to whether still effective, revoked, modified or amended. These orders are listed as an appendix, and an additional feature is the arrangement of them numerically, with a complete title as issued by the Division. A table showing the maximum discounts which may be allowed by producers to registered distributors, and a list of the cases cited as footnotes in the text are also included.

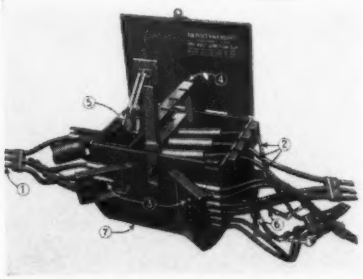
The author has taken special effort to properly index the subject matter and to carefully cross reference each item, and the book, therefore, is a convenient and handy volume on the legal interpretation of the Act.



MANUFACTURERS' Forum

Junction Box for D.-C. Circuits

The Electric Railway Equipment Co., 2900-18 Cormany Ave., Cincinnati, Ohio, announces its new 1228 junction box for d.c. circuits. The features of the units illustrated herewith are as follows:



1. 3-wire incoming power circuit cables (pos., neg. and safety ground). Safety chain and clamp relieves all strain on cable terminals.
2. Out-going positive cables for machine, loader and drill circuits, equipped with removable socket connectors having insulated handles.
3. Pin and socket type connectors for all negative and safety ground cables; mounted on the outside of box to secure complete separation from positive circuits.
4. Safety lever which must be lowered before main switch can be closed. This lever automatically locks all terminal connections in position and prevents any circuit being opened under load.
5. Quick break switch operated by the opening or closing of hinged junction box lid.
6. Detachable strain chains and clamps for each individual circuit and which prevents any strain on cable connector terminals.
7. Bottom skids to facilitate moving of box to different locations.

The manufacturers standard equipment includes 200, 100 and 35 ampere 250 volt enclosed fuses. Other features listed include solder type terminal connections that eliminate necessity of oil vulcanizing or spading of cables, and the 28 in. height of the box permits use in low coal seams.

Mine Timber Lifting Jack

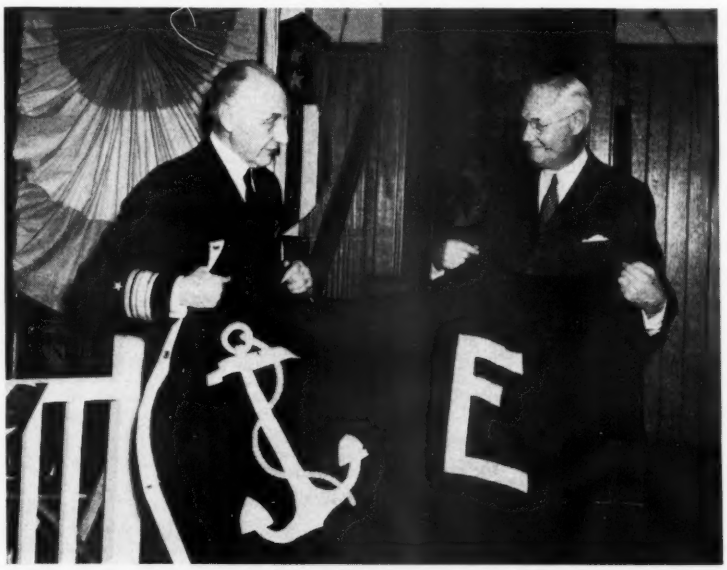
The Duff-Norton Manufacturing Company, 2709 Preble Ave., Pittsburgh, Pa., announces its new mine timber lifting jack, a lightweight, high speed unit designed to cut timbering costs. By simplifying design, and through use of light, high-strength materials, the weight of the jack has been kept to a minimum.

The manufacturer states that these features save time and labor in essential timbering operations, as the jack is easy to move, quick to set up and is simple to adjust. Only a 13-in. manual lift is required to place the timber on the platform. The jacks are used singly or in pairs, as required, to quickly and easily bring timbers into place.

Sterling Pump Company Sold

Peerless Pump Division of the Food Machinery Corporation, Los Angeles, Calif., and Canton, Ohio, announces the acquisition of the Sterling Pump Corporation, Hamilton, Ohio, and Stockton, Calif. Peerless will consolidate the Sterling plant at Hamilton with the new Peerless manufacturing plant at Canton, Ohio. Sterling's Stockton plant will be merged with the John Bean Manufacturing Company, Division of the Food Machinery Corporation, San Jose, Calif. According to Vernon Edler, vice president and general manager of the Peerless Pump Division, consolidation of the two manufacturing plants will greatly expedite handling of a tremendously expanded volume of pumps on order at both concerns. Personnel affected by the purchase of Sterling by Peerless Pump is as follows: H J. McKenzie, president of Sterling Pump Corp., joins the Peerless Pump Division as assistant to Mr. Edler; Fred Jones, manager of Sterling's New York office, will continue with Peerless; John Mikesell, formerly engineer for Sterling, will assume the position of manager of Sterling and small products line; Jack Wade, Sterling's chief engineer, will be in charge of the new developments at the Canton plant; other employes of Sterling will be retained in the Peerless organization. Peerless personnel remains unchanged; Claude Cook, B. J. Craig and Ed Pierce will continue as eastern division manager, eastern works manager, and eastern sales manager, respectively.

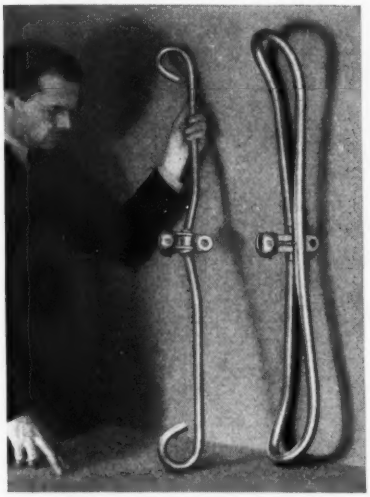
All-Navy "E" Presentation to the Electric Storage Battery Company



In colorful ceremonies on Saturday, March 28, 1942, Rear-Admiral W. C. Watts, U.S.N., representing the Secretary of the Navy, presented the All-Navy "E" pennant to Mr. R. C. Norberg, President of The Electric Storage Battery Company, manufacturers of Exide Batteries. This was the first All-Navy "E" Award in Philadelphia. Thousands of enthusiastic Exide workers cheered as the blue burgee was raised, while a color-guard stood at attention. The ceremonies were conducted by John B. Kennedy, radio commentator. In addition to Admiral Watts and Mr. Norberg, there were addresses by Hon. James J. Davis, Hon. John E. Sheridan, Charles Goff, President, Battery Workers' Union and Lt. Commander Trautman, U.S.N.

Arcing Horns for Increasing Protection of Conductors

The Ohio Brass Company, Mansfield, Ohio, announces the development of two types of boltless arcing horns for attachment at the bottom of insulator strings, to provide conductors on high-voltage transmission lines with adequate protection from power arcs. Both devices are made of pipe to eliminate sharp edges and are said to be free of radio interference at voltages well above their recommended line ratings. They both offer



Radio-proof, boltless arcing horns by The Ohio Brass Co., for protecting conductors on high-voltage lines from power arcs

increased conductor protection, the manufacturer claims, because they are longer (40 in. over-all), have greater coverage and use larger, heavier metal sections than other designs. One style, known as the Longhorn, is intended for 115, 138 and 161-kv. lines. It consists of two lengths of ½-in. pipe (0.84-in. O.D.), threaded into a special socket eye. Each pipe terminates in a 4-in. loop and the open ends are plugged. Where half a horn is used on dead-end strings, the unused hole in the socket eye is sealed with a pipe plug.

The other style, using a Figure 8 design and called the Bighorn, is suitable for lines up to and including 230-kv. It is made of ¾-in. pipe (1.05-in. O.D.), welded to form a continuous loop. Grooves in a special socket eye support the horn, two fins keep the horn from tilting and another pair of fins engage in slots in the pipe to prevent endwise movement.

New Rotary Type Control Switch

A new double-break, direct-acting rotary switch for the control of circuit breakers has been developed by the Roller-Smith Company, Bethlehem, Pa. The switches are insulated for 600 volts and have a continuous current carrying capacity of 10 amperes.

This switch is built up of units, each unit consisting of two single break contacts connected in series by means of a jumper. The switch has a spring return arrangement so that when the handle is released the switch returns to the off position, opening the contacts. The handle is of the pistol grip type, facilitating operation of the switch. A red and green target is furnished as a part of each switch to indicate the last position of the switch.

Pomona Pump Company Expands

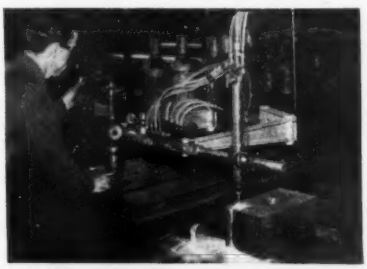
Pomona Pump Co., manufacturers of vertical pumps, announce the purchase of the Westco Pump Division of Micro-Westco, Inc., Bettendorf, Iowa. The newly acquired business will be operated as Pomona Pump Co., Westco Division, at 2621 Locust Street, St. Louis, Mo., and manufacture continued from the St. Louis plant of the Pomona Pump Co. Management and key personnel of Westco will be transferred to St. Louis to continue the manufacture and distribution of the complete line of Westco pumps.

Divergent Nozzle Increases Cutting Speed

A series of oxyacetylene machine cutting tips of revolutionary design increase the cutting speed of machine torches by 20 to 30 percent and assure cuts of a quality comparable to those obtained with standard tips, is announced by Air Reduction, 60 E. 42nd Street, New York, N. Y.

The Airco "45" high speed machine cutting tip has a nozzle with a divergent exit portion—a design that makes it possible to eject a narrow, high velocity stream of oxygen, practically free of exit turbulence, that burns a narrower path or kerf, through the metal, than the conventional cutting tip. As a result of burning away less width of metal in a cut, the Airco "45" cuts with no increase in oxygen consumption.

As the oxygen stream penetrates



The Airco "45" high speed machine cutting tip with divergent nozzle takes little time cutting out a semi-circular piece from this 6-in. thick alloy-steel block

steel, its velocity is constantly dissipated. The divergent tip principle, increases the velocity of the oxygen stream, and provides a higher oxygen concentration at greater depths, thereby increasing the oxidation rate of the metal being cut. This makes cutting with this unit a faster and more economical process. The machine's cutting tips are available in sizes 0, 1, 2, 3, 4, 6, 8 and 10 for cutting metal thicknesses up to 8 inches. The tips fit standard machine cutting torches. To increase cutting speeds 20 to 30 percent, it is only necessary to substitute one of the new divergent tips for the conventional style tip.

Heavy Duty Rock Drill

The latest addition to the Ingersoll-Rand family of rock drills is the D-505 Drifter. It incorporates many new and improved features, and is the fastest and most durable drifter ever produced by the company. Exhaustive tests have shown that the efficiency of the D-505, based on inches drilled per cubic foot of air at 90 pounds pressure, is 34 percent greater than that of the company's previous

4-inch-bore machines, and 52 percent greater at 70 pounds pressure.

Among outstanding features of this new drill is its ruggedness. The wall section of the fronthead is 10 percent thicker than that of the previous 4-inch drifters. The shank aligner is 18 percent longer and 8 percent thicker, and an improved chuck design of heavier construction has been included. The design of the piston-stem cushion bearing permits a heavier metal section in the cylinder and furnishes better support. There is a port on each side of the cylinder —a feature which balances the piston within the cylinder.

Air to the front end of the cylinder passes directly between the ratchet and the head of the rifle bar. It is unrestricted by small ports and this assures good hole-cleaning, and aids in supplying constant lubrication to all moving parts. The D-505 employs a sturdy rifle bar which makes possible strong rotation. The rifle bar pawls are reversible for longer life. Operators will find that the throttle handle is more readily accessible, and that it is well protected by the backhead so that it cannot be broken easily.

Respirator for Protection Against Toxic Dusts

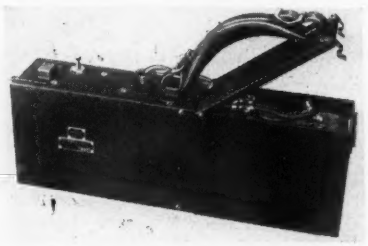
American Optical Company, of Southbridge, Mass., announces a new respirator for protection against toxic dusts. Representing an entirely new design in toxic dust respirators, this new American R9100-T respiratory protector is light in weight and gives full vision, while the entire face piece is itself a filter and compresses maximum protection area into minimum space.

The closely felted, laboratory-tested filter has been approved by the U. S. Bureau of Mines for protection against the inhalation of toxic or poisonous dusts (dispersoids or particulate matter formed by the disintegration of solid materials by such processes as crushing, grinding and abrading) as lead, cadmium, arsenic, chromium, manganese, selenium, vanadium and their compounds.

The easily adjusted face piece with its leak-sealing cantilever edges of pure, pliable rubber gives real face-fitting comfort. The simple, non-reversing exhalation valve is said to give positive protection.

Handy Ultra Violet Light for Prospectors

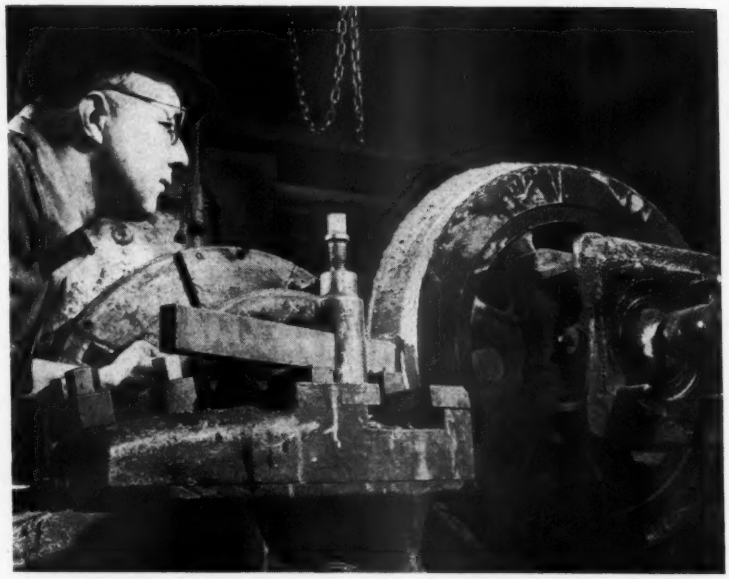
A new model of Mineralight ultra violet ray black light lamp, useful for instantly identifying the tungsten ore scheelite, as well as many other minerals which also fluoresce under black light, is announced by Ultra-Violet Products, Inc., 5205 Santa Monica Blvd., Los Angeles, Calif. Designed for use by prospectors, mineralogists and collectors, the new model, No.



564, operates with a cell in a built-in compartment, and features a built-in regular flashlight in addition to the black light lamp. A double contact switch enables the operator to use either type of light at will, thus permitting him to look carefully for likely indications with the regular light, and upon encountering them to check up at once with the black light.

Instant identification of the presence of tungsten in scheelite ore and many other minerals by Mineralight, is due to the fact that black light excites fluorescence of such ores. Many different and beautiful colors result, and identification is both immediate and positive. A collection of 20 labeled minerals is supplied with each lamp for the benefit of the user. The unit is portable, weighing 7½ pounds, including two 6-volt lantern batteries. Its high ultra-violet efficiency will detect scheelite as far as 10 feet away. Small batteries will operate the lamp for from 15 to 20 hours.

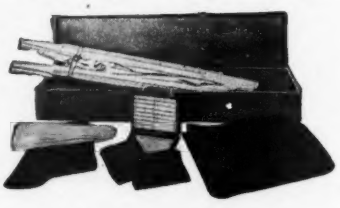
TRIMMING METAL "CAMEL BACK"



After an automatic electric welding machine fills the grooves of worn metal tires, the steel retread is trimmed to the proper contour on lathes like this one at the Westinghouse Homewood Plant in Pittsburgh, Pa. Automobile retreads are made with "camel back," a compound of crude and reclaimed rubber, but the material used in these locomotive tires retreads is the finest grade high carbon steel

Some New Safety Items

Mine Safety Appliances Co., Pittsburgh, Pa., recently announced its new M. S. A. folding stretcher outfit and M. S. A. wood traction splint. The folding stretcher is a strongly constructed new-type outfit designed for locations where a compact unit is desired. It is 49 in. long when folded, and is quickly opened to full size Army type. The frame is made of selected dried ash, and all metal parts are of malleable iron. The cover is of 12-oz. duck. Included in the all-weather dust-proof steel case are the folding stretcher, a wool and



a rubber blanket, four wood splints, two chemical hot pads, and a 16-unit all-weather first-aid kit. An instruction sheet is furnished with each outfit.

The new M. S. A. wood traction splint is designed for use in supporting fractures of the arms or legs according to the accepted traction method prescribed by the American Red Cross. The splint, made of clear hard maple with chamfered edges and shellac finish, is extensible to 66 in., to meet the maximum requirements. It telescopes to a compact size and is quickly adjustable to the patient, the splint being securely locked by bolts with wing nuts and knurled washers.

Of interest to the coal mining field is the new M. S. A. high-pressure rock dust distributor known as the Type "S." This machine is designed to keep pace with rapid advance work, typical of modern high-speed concentrated mining methods, at a new low cost. The unit discharges at least 225 pounds of rock dust per minute through a 4-ft. section of hose, and between 90 and 100 pounds per minute through 500 ft. of hose.

The Foille spray kit, for emergency treatment of burns, is another development of the company that is said to be receiving wide acceptance. The burn kit, which utilizes Foille, the new scientific preparation for treatment of burns, providing quick relief of pain, characteristic absence of infection, and aids in faster healing, is supplied with an efficient spray gun so designed that a constant spray is forced through the atomizer tip, quickly covering the burned area. An ample supply of Foille in jars, which connect to the spray gun, is ready for immediate use when needed.

New Motors

The General Electric Co., Schenectady, N. Y., announces an addition of three new motors—a vertical general-purpose polyphase motor, a vertical shielded polyphase motor (1 to 20 hp.), and a vertical shielded single-phase motor (1 to 5 hp.), to its Tri-Clad family. The shielded-type motors are especially suited to pumping applications, and the general-purpose motor is suitable for use in the machine tool industry as well as for agitators, mixers, and similar applications.

The compact, cast-iron frame and cover of the general-purpose motors are designed to give added protection to electrical parts without adding materially to the over-all height. The use of Formex wire, new punchings and coil shapes, double-end ventilation, and balanced design are features contributing to long life. Bearings are of the deeply grooved type, and are encased in machined cast-iron housings.

Features that contribute to convenience of operation are accessibility of grease fittings, the location of eyebolts makes the motor easy to handle; speed measurements are taken by removing the monogram cap from the upper end shield and a variety of bases makes it possible for this motor to meet many applications and mounting requirements.

The polyphase shielded-type motors are available in either solid-shaft or hollow-shaft construction, while the single-phase shielded-type motors are available only in solid-shaft construction. Both shielded types are for normal-thrust or high-thrust applications. These motors are suitable for outdoor operation except where extremes of moisture, dust, or other harmful agents make the selection of fan-cooled motors more economical. All frame sizes have common mounting dimensions, making possible inter-changeability of many horsepower and speed combinations, including single-phase ratings. The motors can be rotated to any one of four base positions without modification of the supporting structure.

New Dynamite Cartridge that Expands Under Tamping

A new dynamite cartridge which will expand under tamping to fill the bore hole and concentrate the charge has been developed by the Explosives Department of Hercules Powder Company, Wilmington, Del., the company announced recently. The new cartridge, called "Tamptite," eliminates the necessity of slitting cartridges, and permits concentration of a charge within the hole with little or no spillage of powder.

Dynamite in the new cartridge is packed in a waxed paper shell having a line of perforations spiraled around the dynamite stick, located between inner and outer layers of paper so that there is no direct track through which moisture might enter or ingredients leak out. When tamped in a bore hole, the cartridge does not open as a slit cartridge does, but unwraps slightly as the cartridge expands to fill the hole. Splitting along the perforated line permits the dynamite to be telescoped to a shortened length while it expands to the diameter of the hole.

Even in upper holes where dynamite in slit cartridges often spills, little or no spillage is said to occur with the new cartridge. The cartridge will make obsolete the practice of slitting cartridges before loading the common method of concentrating the charge to obtain better breakage and pull more material.

CATALOGS AND BULLETINS

AIR RAID PROTECTION. *E. D. Bullard Co.*, 275 Eighth Street, San Francisco, Calif. Leaflet describes protective equipment, such as air raid sirens, asbestos suits, steel helmets, gloves, and goggles. The leaflet shows the equipment necessary for groups of 25-50, 50-100, and 100-200 people, or for each floor, and lists prices to help the purchaser determine the investment necessary to protect adequately his property and employes. 2 pp.

COMPRESSORS. *Ingersoll Rand Co.*, 11 Broadway, New York City. "Compressed Air Will Increase Production" is the title of Form 2742, that describes and illustrates the company's line of compressors for many industrial uses.

Worthington Pump and Machinery Corp., Harrison, N. J. Bulletin L-675-B1 describes and illustrates features of the manufacturer's line of horizontal duplex, motor-driven, direct-connected and belted compressors from 75 to 3,000 hp. 28 pp.

Bulletin H-620-B16F describes and illustrates the company's two-stage air-cooled air compressors, having 80 to 125 lb. pressure. 8 pp.

Bulletin H-621-B8 describes and illustrates features of the manufacturer's Type VS vertical single cylinder, single stage air or water cooled compressors for paint spraying, cleaning, light sand blasting or small air systems for industrial plants. 6 pp.

CONSERVATION. *The B. F. Goodrich Co.*, Akron, Ohio. "How to Get the Most Out of Industrial Rubber Products" is the title of a series of pamphlets issued by the company. The titles of the pamphlets are: (1) Transmission Belting; (2) Conveyor Belts; (3) V-Belt Drives; (4) Belt Salvage; (5) Rubber Hose; and (6) Mats and Matting.

CONVEYING EQUIPMENT. *Chain Belt Co.*, Milwaukee, Wis. Bulletin No. 410 contains information and pictorial descriptions of the company's line of Rex belt conveyors, apron conveyors, and bucket elevators. 16 pp.

CRUSHERS. *Alloy Steel and Metals Co.*, 1862 East Fifty-fifth Street, Los Angeles, Calif. Bulletin 116 lists specifications and illustrates the manufacturer's 15 x 28-in. and 15 x 38-in. Pacific jaw crushers. 4 pp.

American Pulverizer Co., 1249 Macklind Avenue, St. Louis, Mo. The company has issued a bulletin describing its "AC" Type rolling ring crusher for reducing bauxite, coal, rock salt, and other materials. 8 pp.

DETACHABLE BITS. *Ingersoll-Rand Co.*, 11 Broadway, New York City. "How Jackbits Reduce Rock Drilling Costs" is the title of Bulletin 2780, issued by the company. 24 pp.

DIAPHRAGM PUMPS. *Denver Equipment Co.*, Denver, Colo. Bulletin P6-B describes and illustrates the company's adjustable stroke diaphragm pumps, and illustrates features of its line of vertical sand pumps. 4 pp.

DIESEL LOCOMOTIVES. *General Electric Co.*, Schenectady, N. Y. GEA-3666 describes and illustrates features of the manufacturer's 45-ton, 4-axle, 300-hp. Diesel electric switching engine. 16 pp.

DUST COLLECTORS. *American Foundry Equipment Co.*, 555 South Byrkit Street, Mishawaka, Ind. Catalog No. 72 is offered by the company as a handy manual to serve plant engineers and officials in the selection of proper control equipment for specific dust problems. 58 pp.

EXPLOSIVES. *Atlas Powder Co.*, Wilmington, Del. "Nine Ways to Get the Most from Your Explosives" is the title of a folder issued by the company. The items discussed include loading, cutting, drilling, and stemming, and the proper use of explosives to improve mine safety. 10 pp.

FILTERS. *Denver Equipment Co.*, Denver, Colo. Bulletin F8-B1 describes and illustrates features of the company's 3 x 1-ft. and 3 x 2-ft. rotary vacuum filters. 4 pp.

GRINDING MILLS. *The Eimco Corporation*, Salt Lake City, Utah. Bulletin No. 201 describes and illustrates the manufacturer's line of rod and tube mills. Cross-sectional drawings of these units, together with information on weights, sizes, capacities, floor space requirements, etc., are also included. Information on the company's super-molychrome ball-mill liners and the cumochrome crushing-plates and roll-shells are also given. 20 pp.

IRON CEMENT. *Smooth-On Manufacturing Co.*, 570 Communipaw Avenue, Jersey City, N. J. The company has issued a small folder describing features of its No. 7B Quick Patch Concrete Cement for filling cracks and holes in concrete floors. 4 pp.

MINE CARS. *Irwin Foundry & Machine Car Co.*, Irwin, Pa. The company recently announced a new catalog describing its line of mine cars and accessories. 24 pp.

PREPARATION PLANTS. *McNally-Pittsburg Mfg. Corp.*, 307 North Michigan Avenue, Chicago, Ill. Bulletin 142 is a well-illustrated and comprehensive bulletin describing features of the manufacturer's equipment for coal preparation plants. 48 pp.

SWITCHES. *Roller Smith Co.*, Bethlehem, Pa. Catalog 7140 describes the manufacturer's line of rotary type, control, transfer and auxiliary switches. 16 pp.

Trumbull Electric Mfg. Co., Plainville, Conn. Company offers a circular describing features of heavy-duty switches for special applications. 4 pp.

V-BELTS. *Allis-Chalmers Mfg. Co.*, Milwaukee, Wis. Bulletin B6082-A describes and illustrates stationary and motion-control sheaves. Operating diagrams, sizes, and dimensions are included. 16 pp.

"More Power To You" is the title of Bulletin B 6190 that illustrates and describes the company's latest line of Texrope V-belts. 6 pp.

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use HYDROTATOR
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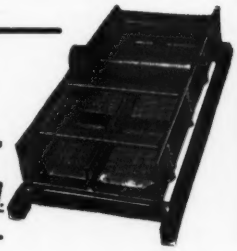

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61% of all Safety Directors Say— "Use Preformed Wire Rope to Reduce Accidents"

EXCERPT FROM PAGE 62, Dec. 1941 "NATIONAL SAFETY NEWS"

Preformed Rope Reduces Injuries

Preformed rope, according to returns from the questionnaire, has been adopted by many companies in order to avoid barbs caused by ends of broken wires. Preformed rope does this in two ways: first, the wire ends do not stick out from the rope when the wire breaks, but continue to lie in position against the rope body; and second, the high resistance of preformed rope to fatigue results in fewer wire breaks developing in a working rope, all other things being equal.

"Buy only preformed rope," cautions the safety engineer of a large automobile company, "since it is safer and cheaper in the long run." The safety officer of a federal government agency says, "There is far more likelihood of workers receiving puncture injuries while handling non-preformed rope than from the preformed type." A metal mine reports that their injury rate and compensation costs due to hand injuries from handling slusher ropes dropped to almost zero when they changed to preformed rope, and two other mines corroborated this report from their own experience. A rubber company says, "We definitely favor preformed rope." Other companies report similar experience.

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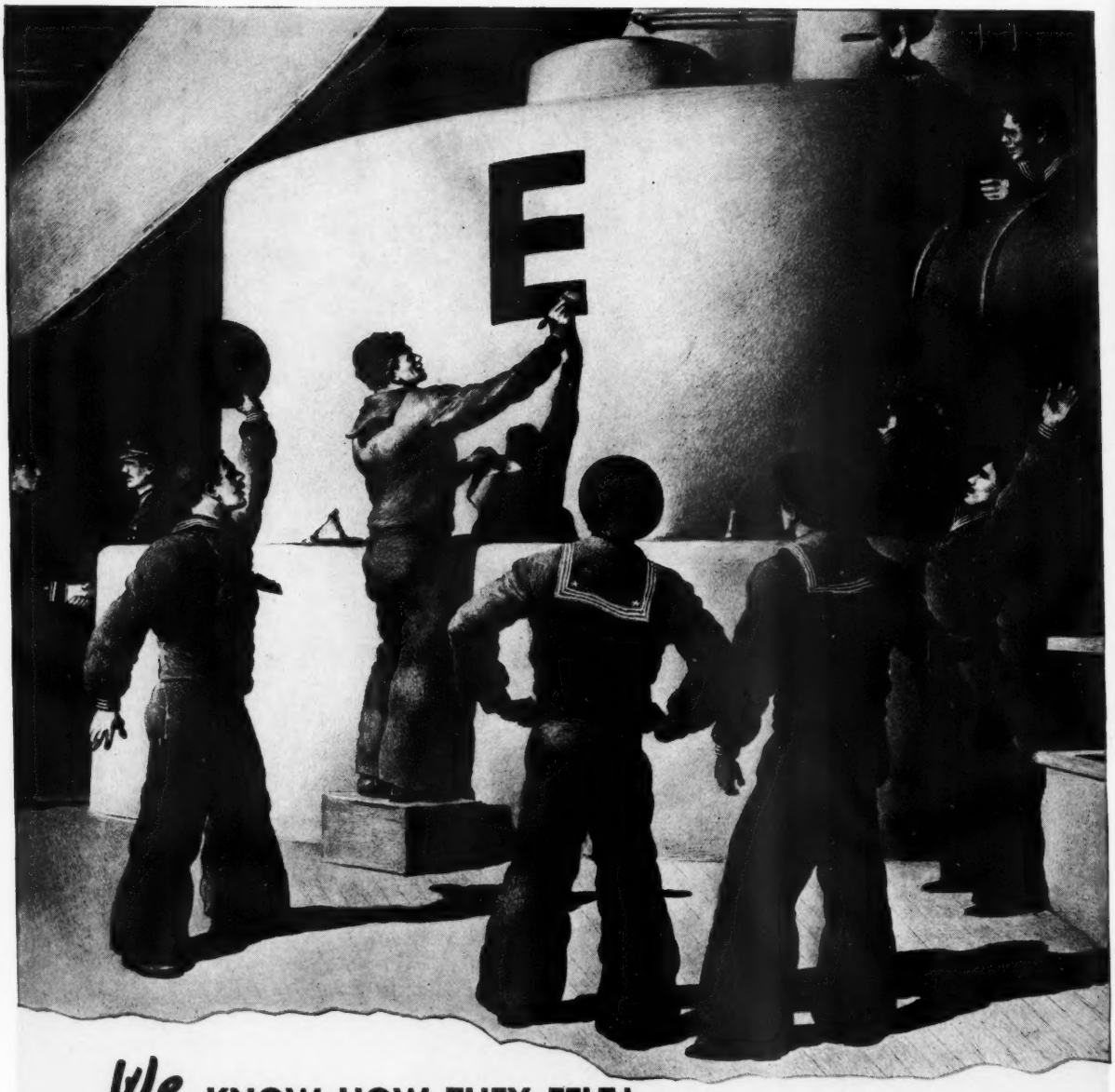

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